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ORIGINAL

A Guide to NSF Science Resources Data

COMPLETED

NATIONAL SCIENCE FOUNDATION
Directorate for Scientific, Technological
and International Affairs
Division of Science Resources Studies



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Introduction

Among the many missions assigned to the National Science Foundation (NSF) by the Congress is the authority and responsibility to

... appraise the impact of research upon industrial development and upon the general welfare; ... maintain a current register of scientific and technical personnel, and in other ways to provide a central clearinghouse for the collection, interpretations, and analysis of data on the availability of, and the current and projected need for scientific and technological ... to initiate and maintain a program for the determination of the total amount of money for scientific research ... PL 81-507, Sec. 3.(a).

To accomplish this task, the Division of Science Resources Studies (SRS) designs and conducts surveys and supports other data collection activities dealing with science resources. The data from these surveys and data collection efforts are used in NSF and other analyses of various R&D funding and scientific and technical labor market issues. This document is a guide to the recurring portions of these data bases including scope, size of sample, and pertinent variables.*

The abstracts found in this Guide provide a minimum introduction to these data resources. More complete descriptions can be found in the technical notes of publications cited for each data base, which provide a wealth of technical detail and also contain copies of the current survey instruments employed.

Inquiries concerning the surveys should be addressed to:

Scientific and Technical Personnel:

Neil Dumas
Scientific and Technical Personnel
Studies Section
Division of Science Resources Studies
(202) 634-4691

Research and Development:

Funds and Personnel:

Norman Friedman
R&D Economic Studies Section
Division of Science Resources Studies
(202) 634-4625

Where not otherwise stated, all requests for publications should be directed to:

Editorial and Inquiries Unit
Division of Science Resources Studies (L-611)
National Science Foundation
Washington, D.C. 20550

Other sources for publications are:

National Technical Information Service (NTIS)
U.S. Department of Commerce
Springfield, Virginia 22151

Superintendent of Documents
U.S. Government Printing Office (GPO)
Washington, D.C. 20402

* This guide covers only data pertaining to inputs to science and technology. Various output measures are also compiled, see for example, *Science Indicators*—1976, National Science Board (NSB 77-1).

Scientific and Technical Human Resources

The National Survey of Experienced Scientists and Engineers

Purpose

This biennial survey is a continuing longitudinal effort to maintain a comprehensive picture of the development and utilization of the scientists and engineers who were in the labor force in 1970. The primary purpose of the National Survey is to provide the main sample or cohort for the NSF Personnel Characteristics System in an attempt to measure the demographic, employment and geographic characteristics of the Nation's science and engineering (S/E) personnel. This sample comprises the primary data base studied over time to detect changes in the Nation's total population of scientists and engineers.

1972 Sample

The 1972 Professional, Technical and Scientific Manpower Survey was conducted through a national sample of approximately 150,000 scientists and engineers from the population identified by the 1970 Decennial Census. In addition, a smaller sample of nonscientist, nonengineer college graduates was also included. While the initial population (i.e., scientists and engineers) was defined according to responses to an open-ended "occupation" category included in the 1970 Census, more stringent criteria were applied by NSF prior to drawing the sample for the 1972 survey. These new criteria for defining scientists or engineers were developed with the aid of professional societies and ranged from 23 (medical scientists) to 44 (engineers) alternatives per field. The result was that only 1.1 million people remained from the original group (of 2.9 million) categorized as scientists or engineers by the Bureau of the Census. The ultimate response rate for this survey was approximately 73 percent.

1974 Sample

For the 1974 National Survey of Experienced Scientists and Engineers, the 1972 survey sample was augmented, redefined (although ties to the earlier data and a consistent series are maintained via a translation mechanism), and a selection of scientists and engineers was made. To be classified as a scientist or engineer, an individual had to have two or more of the following characteristics: (1) employ-

ment in an S/E field; (2) attainment of a specified educational level in an academic discipline related to the S/E field, or (3) self-identification, based upon total education and experience.

Completed questionnaires were received from about 88 percent of the sample, approximately 44,000, representing a population of slightly over 1,000,000 scientists and engineers in 1974.

1976 Sample

The 1976 Sample was identical to that employed in 1974. The response rate for this survey was approximately 85 percent.

References

Complete sampling information is available in the following NSF publications:

The 1972 Scientist and Engineer Population Redefined

Volume 1. *Demographic, Educational, and Professional Characteristics* (NSF 75-313). Available from NSF, GPO, and NTIS (PB 253 184)

Volume 2. *Labor Force and Employment Characteristics* (NSF 75-327). Available from NSF, GPO, and NTIS (PB 253 604). *Tables. Engineers, by Field* (NSF 76-306). Available from NSF and NTIS (PB 263 540)

Characteristics of the National Sample of Scientists and Engineers

1974: Part 1. *Demographic and Educational* (NSF 75-333). Available from NSF, GPO, and NTIS (PB 253 444)

Part 2. *Employment* (NSF 76-323). Available from NSF, GPO, and NTIS (PB 264 671)

Part 3. *Geographic* (NSF 76-330). Available from NSF, GPO, and NTIS (PB 265 681)

Characteristics of Experienced Scientists and Engineers

1976: *Tables* (NSF 78-305). Available from NSF and NTIS (PB 284 381)

Science Resources Studies Highlights (NSF 77-322). Available from NSF

Survey Instruments

The 1972 survey instrument can be found in Volume 1 of NSF 75-313, *The 1972 Scientist and Engineer Population Redefined*. The 1974 survey in-

strument is found in Part 1 of NSF 75-333, *Characteristics of the National Sample of Scientists and Engineers*. In general, each instrument comprised variables in the following areas: Personal identification data such as sociodemographic variables, as well as labor market variables such as work status and occupation, job activities including salary, and field of professional identification. The 1978 instrument is reproduced on the following pages. All items will be converted to machine (computer)-readable form except those that have pen lines drawn through them.

Data Access

Data in machine (computer)-readable form from the 1972, 1974, 1976, and 1978 surveys can be obtained (when available), subject to reproduction costs and official regulations (e.g., Privacy Act of 1976), from:

Mr. Larry Carbaugh
Data Use Service Division
Bureau of the Census
Room 3624 FOB #3
U.S. Department of Commerce
Washington, D.C. 20233
202/763-2400

BEST DOCUMENT AVAILABLE

O.M.B. No. 99-577003; Approval Expires December 31, 1978

FORM PMS-26D 10-28-77	U.S. DEPARTMENT OF COMMERCE BUREAU OF THE CENSUS	NOTICE - Your report to the Census Bureau is confidential. It may be seen only by sworn Census employees and may be used only for statistical purposes.
1978 NATIONAL SURVEY OF NATURAL AND SOCIAL SCIENTISTS AND ENGINEERS		<i>Please read</i> instructions carefully before answering questions. Answer as accurately as you can by printing your reply clearly or by entering an "X" in the box next to the appropriate reply. When the instructions for a question direct you to enter a code and description from a list, please refer to the reference list attached to this questionnaire.
A. Do you currently live in the State (or foreign country) printed in the above mailing label?		PLEASE COMPLETE AND RETURN TO Bureau of the Census 1201 East Tenth Street Jeffersonville, Indiana 47132
1 ☐ Yes, same State (or foreign country) 2 ☐ No, different State (or foreign country) - Please enter your current State (or foreign country) of residence _____		
FROM THE DIRECTOR BUREAU OF THE CENSUS This is the final questionnaire for the series of surveys known as the National Sample of Scientists and Engineers. The National Science Foundation, the project sponsor, and the Bureau of the Census wish to thank you for your invaluable contribution to this program. Each of the biennial surveys has given policymakers and planners an increasingly clearer view of the dynamics of the educational system and the job market for one of the Nation's central resources—highly trained persons. The goal of this final survey is to complete the picture for the decade of the 1970's. Thus, we are asking you to provide one final report on your employment and related topics. The questionnaire is much shorter than previous ones. Please note that the sample includes many kinds of highly trained persons in addition to scientists and engineers. For the survey to be successful and yield truly representative information, it is important that each person fill out and return the questionnaire. Please complete the questions which follow on pages 2 through 4 and return your questionnaire in the enclosed preaddressed envelope. For some questions you are instructed to enter a code and description from Reference List A, B, or C. These lists are attached to the questionnaire. This information is being collected under the authority of the National Science Foundation Act of 1950, as amended. The information you provide is confidential and may be seen only by sworn employees of the Bureau of the Census. The information cannot be used for anything but statistical purposes and cannot be given to any other Government agency, private concern, or individual. The data will be released only in the form of statistical summaries from which it will be impossible to identify information about any particular person. Your response is entirely voluntary, and your failure to provide some or all of the requested information will in no way adversely affect you. Thank you for your cooperation. Sincerely,  MANUEL D. PLOTKIN Enclosure		

PART I - EDUCATION AND TRAINING																	
1. Since January 1972 have you attended any college, university, or other post high school institution?	1 ☐ Yes - Continue with question 2a 2 ☐ No - Skip to question 4																
2a. What is the highest degree you have RECEIVED since January 1972? <i>Mark only one box</i>	1 ☐ Associate 2 ☐ Registered Nurse (R.N.) 3 ☐ Bachelor's 4 ☐ Master's 5 ☐ First Professional Non-Medical (J.D., LL.B., Th.B.) 6 ☐ First Professional Medical (D.O.M., D.D.S., D.O., D.V.M., M.D.) 7 ☐ Doctorate 8 ☐ Other - _____ 9 ☐ None - Skip to question 4																
b. When was this degree awarded? <i>If you received more than one degree at the same level (e.g., two master's degrees), enter the year of award of the most recent one.</i>	19 ____																
3. What was the major field of study of the degree you described in question 2? <i>Enter code and description from Reference List A.</i>	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 10%;">Code</th> <th style="width: 90%;">Description from Reference List A</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">1</td> <td>_____</td> </tr> <tr> <td style="text-align: center;">2</td> <td>_____</td> </tr> </tbody> </table>	Code	Description from Reference List A	1	_____	2	_____										
Code	Description from Reference List A																
1	_____																
2	_____																
4. Aside from formal education, which of the following types of training did you receive in 1976 or 1977? <i>Mark the appropriate year for each type of training you have received.</i> (1) On-the-job training (2) Military training applicable to civilian occupations (3) Extension or correspondence courses (4) Courses at employer's training facility (5) Courses at adult education center (6) Other training (7) None	<table style="width: 100%;"> <thead> <tr> <th style="width: 50%; text-align: center;">a. 1976</th> <th style="width: 50%; text-align: center;">b. 1977</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">1 ☐</td> <td style="text-align: center;">1 ☐</td> </tr> <tr> <td style="text-align: center;">2 ☐</td> <td style="text-align: center;">2 ☐</td> </tr> <tr> <td style="text-align: center;">3 ☐</td> <td style="text-align: center;">3 ☐</td> </tr> <tr> <td style="text-align: center;">4 ☐</td> <td style="text-align: center;">4 ☐</td> </tr> <tr> <td style="text-align: center;">5 ☐</td> <td style="text-align: center;">5 ☐</td> </tr> <tr> <td style="text-align: center;">6 ☐</td> <td style="text-align: center;">6 ☐</td> </tr> <tr> <td style="text-align: center;">7 ☐</td> <td style="text-align: center;">7 ☐</td> </tr> </tbody> </table>	a. 1976	b. 1977	1 ☐	1 ☐	2 ☐	2 ☐	3 ☐	3 ☐	4 ☐	4 ☐	5 ☐	5 ☐	6 ☐	6 ☐	7 ☐	7 ☐
a. 1976	b. 1977																
1 ☐	1 ☐																
2 ☐	2 ☐																
3 ☐	3 ☐																
4 ☐	4 ☐																
5 ☐	5 ☐																
6 ☐	6 ☐																
7 ☐	7 ☐																
PART II - EMPLOYMENT																	
5a. What was your employment status during the week of February 12-18, 1978?	1 ☐ Employed full time (including self-employed full time) - Skip to 6a 2 ☐ Employed part time (including self-employed part time) - Answer 5b 3 ☐ Unemployed and seeking work - Go to Part III 4 ☐ Not employed and not seeking work - Skip to 7																
b. If you worked part time, were you seeking full-time work?	1 ☐ Yes 2 ☐ No																
6a. Were you working in a position related to science or engineering during the week of February 12-18, 1978?	1 ☐ Yes - Go to Part III 2 ☐ No - Answer 6b																
b. What was the most important reason for taking this position? <i>Mark only one box</i>	1 ☐ Preferred nonscience or nonengineering position 2 ☐ Promoted out of science or engineering position 3 ☐ Pay was better in nonscience or nonengineering position 4 ☐ Locational preference 5 ☐ Science or engineering position not available 6 ☐ Other - _____ <i>Specify</i> (Go to Part III)																
7. If you were not employed and not seeking work during the week of February 12-18, 1978, what was your most important reason for not seeking work? <i>Mark only one box</i>	1 ☐ On vacation or otherwise temporarily absent from a job for health or personal reasons 2 ☐ On layoff from a job 3 ☐ Retired 4 ☐ Student 5 ☐ Tending to family responsibilities 6 ☐ Could not find work or believed no jobs available in my particular field 7 ☐ Other - <i>Specify</i> _____ (Go to Part III)																

PART III - JOB ACTIVITIES	
INSTRUCTIONS a. Complete questions 8-15 for the job held during the week of February 12-18, 1978, or, if you did not hold a job during that week, complete these questions for your most recent job prior to that week. b. If you held more than one job, please report only the job at which you worked the greatest number of hours.	
8. Where did you work? Write in city and State or foreign country of company, business, agency, or other employer.	Job held during the week of February 12-18, 1978, or most recent prior job. City _____ State or foreign country _____
9. What kind of business was this? Enter code and description from Reference List B.	Code Description from Reference List B _____ _____
10. What was your occupation? Enter code and description from Reference List C.	Code Description from Reference List C _____ _____
11a. What percent of working time did you devote to each of the following activities? Entries should sum to 100%. PLEASE NOTE Basic research is study directed toward gaining scientific knowledge primarily for its own sake. Applied research is study directed toward gaining scientific knowledge in an effort to meet a recognized need. Development is direction of the knowledge gained from research toward production of useful materials, devices, systems, and methods.	01 _____ % Management or administration of research and development 02 _____ % Management or administration of other than research and development 03 _____ % Teaching and training - preparing and teaching courses, guiding and counseling students or trainees 04 _____ % Basic research 05 _____ % Applied research 06 _____ % Development - product, process, and technical development 07 _____ % Report and technical writing, editing, information retrieval 08 _____ % Clinical diagnosis 09 _____ % Design of equipment, processes, models 10 _____ % Quality control, testing, evaluation, or inspection 11 _____ % Operations - production, maintenance, construction, installation 12 _____ % Distribution - sales, traffic, purchasing, customer and public relations 13 _____ % Statistical work - survey work, forecasting, statistical analysis 14 _____ % Consulting 15 _____ % Computer applications 16 _____ % Other activities - Specify _____ TOTAL-100%
b. Among all these activities, which was your primary and which was your major secondary work activity? Fill in the appropriate code numbers (01-16) from question 11a.	Code (01-16 from Question 11a). ☐ Primary work activity ☐ Secondary work activity
12. Which category best describes the type of organization of your principal employment or postdoctoral appointment? Mark only one box	01 ☐ Business or industry, including self-employed 02 ☐ Junior college, 2-year college, technical institute 03 ☐ Medical school 04 ☐ 4-year college or university, other than medical school 05 ☐ Elementary or secondary school system 06 ☐ Hospital or clinic 07 ☐ Non-profit organization, other than hospital, clinic, or educational institution 08 ☐ U.S. military service, active duty, or Commissioned Corps, e.g., USPHS, NOAA 09 ☐ U.S. Government, civilian employee 10 ☐ State government 11 ☐ Local or other government - Specify _____ 12 ☐ International agency 13 ☐ Other - Specify _____

PART III - JOB ACTIVITIES - Continued									
13. What was the basic salary associated with this position? (If not working during February 12-18, report ending salary of most recent prior job.) If you were on a postdoctoral appointment, include stipend plus allowances. (Basic salary refers to salary before deductions for income tax, social security, retirement, etc. but does not include bonuses, overtime, summer teaching, or other payment for secondary jobs.)		Job held during week of February 12-18, 1978, or most recent prior job a. \$ _____ .00 b. ☐ Per year ☐ Per month ☐ Per week c. If academically employed, mark whether salary is for - ☐ 9-10 months ☐ 11-12 months							
14. Between what dates did you hold this position? Enter month and year Consider a change in positions to have occurred if there were significant changes in your duties, level of responsibility, or occupation, even if you continued to work for the same employer.		a. Beginning month and year: _____ b. Ending month and year: _____ OR ☐ Present							
15a. Was ANY of your work supported or sponsored by U.S. Government funds? 1 ☐ Yes - Continue with 15b 2 ☐ No 3 ☐ Don't know } Skip to 15e		<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> 01 ☐ AID (Agency for International Development) 02 ☐ Department of Agriculture 03 ☐ Department of Commerce 04 ☐ Department of Defense 05 ☐ Department of Energy 06 ☐ Department of Health, Education, and Welfare 07 ☐ Alcohol and Drug Abuse Mental Health Administration 08 ☐ NIH (National Institutes of Health) 09 ☐ Office of Education 10 ☐ Other HEW - Specify _____ </td> <td style="width: 50%; vertical-align: top;"> 11 ☐ Department of the Interior 12 ☐ Department of Justice 13 ☐ Department of Labor 14 ☐ Department of Transportation 15 ☐ EPA (Environmental Protection Agency) 16 ☐ NASA (National Aeronautics and Space Administration) 17 ☐ NSF (National Science Foundation) 18 ☐ Nuclear Regulatory Commission 19 ☐ Other agency or department - Specify _____ 20 ☐ Don't know source agency or department </td> </tr> </table>		01 ☐ AID (Agency for International Development) 02 ☐ Department of Agriculture 03 ☐ Department of Commerce 04 ☐ Department of Defense 05 ☐ Department of Energy 06 ☐ Department of Health, Education, and Welfare 07 ☐ Alcohol and Drug Abuse Mental Health Administration 08 ☐ NIH (National Institutes of Health) 09 ☐ Office of Education 10 ☐ Other HEW - Specify _____	11 ☐ Department of the Interior 12 ☐ Department of Justice 13 ☐ Department of Labor 14 ☐ Department of Transportation 15 ☐ EPA (Environmental Protection Agency) 16 ☐ NASA (National Aeronautics and Space Administration) 17 ☐ NSF (National Science Foundation) 18 ☐ Nuclear Regulatory Commission 19 ☐ Other agency or department - Specify _____ 20 ☐ Don't know source agency or department				
01 ☐ AID (Agency for International Development) 02 ☐ Department of Agriculture 03 ☐ Department of Commerce 04 ☐ Department of Defense 05 ☐ Department of Energy 06 ☐ Department of Health, Education, and Welfare 07 ☐ Alcohol and Drug Abuse Mental Health Administration 08 ☐ NIH (National Institutes of Health) 09 ☐ Office of Education 10 ☐ Other HEW - Specify _____	11 ☐ Department of the Interior 12 ☐ Department of Justice 13 ☐ Department of Labor 14 ☐ Department of Transportation 15 ☐ EPA (Environmental Protection Agency) 16 ☐ NASA (National Aeronautics and Space Administration) 17 ☐ NSF (National Science Foundation) 18 ☐ Nuclear Regulatory Commission 19 ☐ Other agency or department - Specify _____ 20 ☐ Don't know source agency or department								
b. Which of the following agencies or departments were supporting the work? Mark as many as apply									
PART IV - OTHER INFORMATION									
16a. At anytime during calendar year 1977 were you without a job AND actively seeking employment? 1 ☐ Yes - Continue with 16b 2 ☐ No - Skip to question 17		3 ☐ 1 to 4 weeks 4 ☐ 5 to 10 weeks 5 ☐ 11 to 14 weeks 6 ☐ 15 to 26 weeks 7 ☐ 27 weeks or more							
b. For how many weeks were you seeking employment?									
17. How many years of professional experience, including teaching, have you had? Enter number of years _____ Years									
18. Based on your total education and experience, what do you regard yourself as professionally? Enter code and description from Reference List C.		<table style="width: 100%; border: none;"> <tr> <td style="width: 20%;">Code</td> <td>Description from Reference List C</td> </tr> <tr> <td style="border: 1px solid black; height: 20px;"></td> <td style="border: 1px solid black; height: 20px;"></td> </tr> </table>		Code	Description from Reference List C				
Code	Description from Reference List C								
19. Listed at the right are selected topics of critical national interest. If you devote a significant proportion of your professional time to any of these problem areas, please mark the box for the one on which you spend the MOST time. Mark only one box		<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> 01 ☐ Health 02 ☐ Environment protection, pollution control 03 ☐ Education 03 ☐ Teaching 04 ☐ Other 05 ☐ Space 06 ☐ National defense 07 ☐ Crime prevention and control </td> <td style="width: 50%; vertical-align: top;"> 08 ☐ Food production and technology 09 ☐ Energy and fuel 10 ☐ Other mineral resources 11 ☐ Community development and services 12 ☐ Housing (planning, design, construction) 13 ☐ Other - Specify _____ 14 ☐ Does not apply </td> </tr> </table>		01 ☐ Health 02 ☐ Environment protection, pollution control 03 ☐ Education 03 ☐ Teaching 04 ☐ Other 05 ☐ Space 06 ☐ National defense 07 ☐ Crime prevention and control	08 ☐ Food production and technology 09 ☐ Energy and fuel 10 ☐ Other mineral resources 11 ☐ Community development and services 12 ☐ Housing (planning, design, construction) 13 ☐ Other - Specify _____ 14 ☐ Does not apply				
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20a. Are you physically handicapped? 1 ☐ Yes - Continue with 20b 2 ☐ No - Skip to question 21		3 ☐ Visual 4 ☐ Auditory 5 ☐ Orthopedic 6 ☐ Other - Specify _____							
b. What is the nature of your handicap(s)? Mark as many as apply									
21. Is your ethnic heritage Hispanic? (Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture) 1 ☐ Yes 2 ☐ No									
22. In the event that it is necessary to contact you to clarify some of the information you provided, may we contact you by telephone?		<table style="width: 100%; border: none;"> <tr> <td style="width: 60%;"> ☐ Yes - Enter number(s) on which you can be reached → ☐ No </td> <td style="width: 20%; border: 1px solid black; height: 20px;"></td> <td style="width: 20%; border: 1px solid black; height: 20px;"></td> </tr> <tr> <td></td> <td style="border: 1px solid black; height: 20px;"></td> <td style="border: 1px solid black; height: 20px;"></td> </tr> </table>		☐ Yes - Enter number(s) on which you can be reached → ☐ No					
☐ Yes - Enter number(s) on which you can be reached → ☐ No									
23. Please print your name here		Date prepared							

REFERENCE LIST A - MAJOR FIELDS OF STUDY

This list is to be used in answering question 3 about the field in which you have obtained study or training. It is divided into two sections: Section I is a list of fields of academic study generally leading to bachelor's or higher degrees; Section II is a list of fields of study and training below those generally leading to a bachelor's degree.

Please scan the entire list, choose the appropriate answer for the question and then enter the code and description in the appropriate section of question 3. If none of the categories listed below adequately describes what you were studying or being trained in, use the "Other" category (code 500 or 525) and enter a brief description of what you were studying in the space provided on the questionnaire.

Section I - FIELDS OF ACADEMIC STUDY LEADING TO BACHELOR'S OR HIGHER DEGREES

Code	Description	Code	Description
Biological and Agricultural Sciences and Related Fields		Mathematical Sciences	
501	Agriculture, business	557	Mathematics
502	Agriculture, general	558	Statistics and actuarial sciences
503	Agronomy, field crops	559	Computer sciences and systems analysis
504	Anatomy and histology	560	Operations research/management science
505	Animal physiology		
506	Animal science	Physical Sciences	
507	Bacteriology, virology, mycology, parasitology	560	Astronomy
508	Biochemistry	561	Chemistry
509	Biology, general	562	Geography
510	Biophysics	563	Meteorology
511	Botany, general	564	Physics
512	Dairy science (dairy husbandry)	565	Physical sciences, general
513	Entomology	566	Geology and geophysics
514	Farm management	567	Oceanography
515	Fish and game or wildlife management	568	Physical sciences, other fields
516	Food science (food technology and processing, dairy manufacturing and technology, food industry)		
517	Forestry	Psychology	
518	Genetics	569	Clinical
519	Horticulture	570	Educational
520	Immunology	571	General psychology
521	Microbiology	572	Psychology, other fields
522	Plant pathology		
523	Plant physiology	Social Sciences	
524	Soil science (soil management, soil conservation)	573	Anthropology
525	Zoology, general	574	Area studies, regional studies
526	Biological and agricultural sciences, other fields	575	Economics, agricultural
Education		576	Economics, except agricultural
527	Biological sciences education	577	Foreign service programs
528	Mathematics education	578	Geography
529	Physical sciences education	579	History
530	Trade and industrial training	580	Industrial relations
531	Education, other fields	581	International relations
Engineering		582	Political science or government
532	Aerospace, aeronautical, astronautical, and related fields	583	Public administration
533	Agricultural	584	Social sciences, general
534	Architectural	585	Social work, social administration, social welfare
535	Chemical, petroleum refining	586	Sociology
536	Civil, construction, transportation	587	Social sciences, other fields
537	Electrical, electronics		
538	Engineering sciences, mechanics, physics	Arts, Humanities, and Other Specialties	
539	Engineering technology	588	Arts, general
540	Environmental/sanitary engineering	589	Business and commerce, including accounting, hotel and restaurant administration, and secretarial studies
541	General or unified	590	English and journalism
542	Industrial	591	Fine and applied arts, all fields
543	Mechanical	592	Foreign language and literature, all fields
544	Metallurgical, materials, ceramics	593	Geography
545	Mining, mineral, geological	594	Home economics, all fields
546	Naval architecture and marine engineering	595	Law or prelaw
547	Nuclear	596	Library science
548	Operations research/systems engineering	597	Military science, including merchant marine deck officer
549	Petroleum	598	Philosophy, all fields
550	Engineering, other fields	599	Religion and theology, all fields
Health Fields		600	Other (Describe briefly under the applicable item on the questionnaire.)
551	Medicine or premedicine, and clinical medical sciences		
552	Nursing (4 year or longer program)		
553	Pathology		
554	Pharmacology		
555	Pharmacy		
556	Health professions, other fields (4 year or longer program)		

Section II - FIELDS OF ACADEMIC STUDY AND OCCUPATIONAL TRAINING RELATED TO PROGRAMS BELOW THE BACCALAUREATE

Code	Description	Code	Description
Data Processing-related fields of study or training		Other fields of study or training	
601	Computer programming	616	Business and commerce-related fields of study or training
602	Computer operating	617	Craft (skilled) occupations-related fields of study or training (such as carpentry, bricklaying, tool and die making, etc.)
603	All other data processing fields of study or training	618	Educational-related fields of study or training
Engineering-related fields of study or training		619	Home economics
604	Drafting and design, all fields	620	Nursing and other health service-related fields of study or training
605	Aeronautical technology	621	Operative occupations-related fields of study or training (such as machine operation, driving, inspecting, etc.)
606	Architectural or building technology	622	Police technology or law enforcement
607	Chemical technology	623	Sales and marketing-related fields of study or training
608	Civil technology	624	Service occupations-related fields of study or training (such as cook, beautician, firefighter, etc.)
609	Electrical and electronics technology	625	All other fields of study or training (Describe briefly under the applicable item on the questionnaire.)
610	Industrial technology		
611	Mechanical technology		
612	All other engineering-related fields of study or training		
Science-related fields of study or training			
613	Agriculture		
614	Forestry		
615	Other science-related fields of study or training		

FORM 548-000 (9-28-77)

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REFERENCE LIST B - KINDS OF BUSINESSES

This list is to be used in answering question 9 about the kind of business or industry for which you worked. Please scan the entire list, choose the appropriate answer for the question and enter the code and description from this list. If none of the categories listed below adequately describes the kind of business for which you worked, use the "Other" category (code 731).

Code	Description	Code	Description
Manufacturing		Other Kinds of Business	
701	Aircraft, aircraft engines, aircraft parts	729	Agriculture, forestry, and fisheries
702	Chemicals and allied products	731	Business, personal, and professional services
703	Electrical machinery, equipment and supplies for the generation, storage, transformation, transmission, and utilization of electrical energy	732	Construction
704	Electronic apparatus, radio, television, and communication equipment and parts	733	Engineering or architectural services
705	Electronic computers, accounting, calculating and office machinery and equipment	734	Finance, insurance, or real estate
706	Fabricated metal products (except Ordnance, machinery and transportation equipment)	735	Mining and petroleum extraction
707	Machinery (except electrical) including engines and turbines, farming and construction machinery, mining, metalworking and other manufacturing and service industry machines	736	Private, nonprofit organizations other than educational institutions and hospitals
708	Motor vehicles and motor vehicle equipment including trucks, buses, automobiles, railroad engines and cars	737	Professional and technical societies
709	Ordnance, including manufacture of arms, ammunition, tanks, and complete guided missiles, space vehicles and equipment	738	Research institutions
710	Petroleum refining and related industries	739	Retail and wholesale trade
711	Primary metal industries, including smelting, refining, rolling, drawing, analyzing, and manufacture of castings, forgings and other basic metal products	740	Transportation, communication, or other public utilities
712	Professional and scientific equipment and supplies	741	Other (Describe briefly under the applicable item on the questionnaire.)
713	Other manufacturing including printing and publishing		
Educational institutions		Public Administration (include only U.S. Federal government activities, such as the U.S. Postal Service, U.S. Air Force, State court, Department of Motor Vehicles, city building inspection, or city public welfare. For example, if you work for the U.S. Postal Service use code 753. Federal public administration, on the other hand, if you work at a Veterans' Administration hospital, use code 758. Hospital or clinic, if you work at a State university, use code 714. College or university, if you work for a county road building agency, use code 720. Construction, if you work in a Defense Department research laboratory, use code 728. Research institution.)	
714	College or university (offering at least a bachelor's degree)	752	(uniformed military service)
715	Junior college or technical institute	753	Federal public administration
716	Medical school	754	State public administration
717	Other educational institutions	755	Local public administration (city, county, etc.)
Health Services		756	Regional government
718	Hospital or clinic	757	Other government
719	Other medical and health services		

REFERENCE LIST C - OCCUPATIONS

This list is to be used in answering questions 10 and 18 about your occupational classification. Please scan the entire list, choose the appropriate code and enter the code and description from this list. If you cannot find exactly the right entry, please choose the one that comes nearest to it. If none of the entries is at all appropriate, use the "Other" category (code 475) and enter a brief description in the space provided on the questionnaire.

Code	Description	Code	Description
Engineers, including college professors and instructors		Health Occupations, including persons who are primarily practitioners. Persons engaged primarily in medical research, teaching, and similar activities use code 432. Medical scientist.	
401	Engineer, aeronautical and astronautical	438	Physician or surgeon
402	Engineer, agricultural	439	Technician, dental
403	Engineer, chemical	440	Technician, medical
404	Engineer, civil and architectural	441	Other health occupation (Describe briefly under the applicable item on the questionnaire.)
405	Engineer, electrical and electronic	Technicians and Technologists, except medical	
406	Engineer, industrial	442	Designer, electronic parts and machine tools
407	Engineer, mechanical	443	Designer, industrial
408	Engineer, metallurgical and materials	444	Designer, other
409	Engineer, mining, petroleum, and geological	445	draftsman
410	Engineer, nuclear	446	Surveyor
411	Engineer, environmental and sanitary	447	Technician, biological and agricultural
412	Engineer, operations research systems	448	Technician, electrical and electronic
413	Engineer, other fields (Describe briefly under the applicable item on the questionnaire.)	449	Technician, forest, urban, highways, and architectural
Computer Specialist, including college professors and instructors		450	Technician, mechanical
414	Computer programmer	451	Technician, other engineering
415	Computer systems analyst	452	Technician, physical science
416	Computer scientist	453	Technician, other fields (Describe briefly under the applicable item on the questionnaire.)
417	Other computer specialist (Describe briefly under the applicable item on the questionnaire.)	Teachers	
Mathematicians and Statisticians, including college professors and instructors		454	Teacher, elementary school
418	Actuary	455	Teacher, secondary school
419	Mathematician	456	Teacher, college and university, excluding engineering and science (Engineering and science teachers see codes 401-437 above.)
420	Statistician	Administrators, Managers, and Officials, excluding farm	
421	Operations research analyst	457	Urban and regional planner
Physical Scientists, including college professors and instructors		458	College president or dean
422	Chemist	459	Administrator or manager, scientific and technical research and development
423	Earth scientists including geologists, geophysicists, etc.	460	Administrator or manager, production and operations
424	Physicist, astronomer	461	Administrator, manager, or official, all other, excluding self-employed
425	Atmospheric scientist, meteorologist	462	Self-employed proprietor
426	Oceanographer	All Other Occupations	
427	Other physical scientist (Describe)	463	Accountant
Biological Scientists, including college professors and instructors		464	Attorney or judge
428	Agricultural scientists, including foresters and conservationists	465	Sales worker
429	Biological scientist	466	Clerical worker (such as bookkeeper, secretary, etc.)
430	Biochemist	467	Craft worker (such as baker, carpenter, electrician, mechanic, repair worker)
431	Biophysicist	468	Farmer, owner, manager, tenant, or farm laborer
432	Medical scientist, excluding persons who are primarily medical practitioners, see Health Occupations	469	Fire fighter or police
433	Other biological scientist (Describe)	470	Laborer, except farm
Social Scientists, including college professors and instructors		471	Librarian
434	Economist	472	Merchant or shopkeeper, self-employed
435	Psychologist	473	Operative (such as assembler, factory worker, miner, welder, truck driver, etc.)
436	Sociologist or anthropologist	474	Postal worker
437	Other social scientist (Describe briefly under the applicable item on the questionnaire.)	475	Other occupations, not specified above (Describe briefly under the applicable item on the questionnaire.)

FORM PWS-260 (9-25-77)

National Survey of Recent Science and Engineering Graduates

Purpose

This periodic survey is an attempt to compile national statistics describing the employment and educational characteristics of baccalaureate- and master's-degree level scientists and engineers graduating *after 1970*. As indicated in the previous section, the "Survey of Experienced Scientists and Engineers" biennially collects data about the "stock" of people who were *already at work in 1970*. The latter data, however, would become increasingly inaccurate with passing time unless the "new entrants" into the Nation's S/E population were added to reflect the "birth" process in that stock. Thus, the National Survey of Recent Science and Engineering Graduates is part of a continuing effort to understand and trace the changing nature of "new entrants" to the S/E labor force as well as to provide the means by which national estimates of this population can be made to update the cohort first identified via the 1970 Decennial Census.

It should be noted that post-1970 doctorate recipients are excluded from this survey. See the sections entitled: (a) "Doctorate Records File" and (b) "National Survey of Doctoral Scientists and Engineers" for the sources of data on these recent doctorate recipients.

1974 Sample

The 1974 Survey focused on new entrants into science and engineering who earned bachelor's degrees in the years 1971-73 inclusive. A primary assumption of this survey was that students entering college could be expected to graduate four years later. Thus, a sample of the 1967 *entering* class was drawn to estimate the individuals earning bachelor's degrees in 1971. Similarly, 1968 was chosen to represent the 1972 graduates, and 1969 for the 1973 group. The response rates were 48 percent, 57 percent, and 38 percent, respectively. Thus, researchers should use these data with caution since the low response rates raise serious doubts about the reliability and validity of possible generalizations. Data were collected of the following types: Employer type, work activity, salary, educational history, financing of education, and marital status. Complete data concerning the 1974 sample can be found in:

Cartter, A.M. et. al., "Manpower Survey of 1967-1969 College Entrants," Final Report to NSF (Contract #-C885), February 1976, Laboratory of Research on Higher Education, University of California, Los Angeles.

1976 Sample

Approximately 16,000 persons who earned bachelor's or master's degrees between July 1973 and June 1975 were surveyed. This represented a stratified (by discipline) sample of 7,000 recipients of bachelor's degrees and 1,000 recipients of master's degrees from each of the two years, class of 1974 and class of 1975. Their names were drawn from 297 usable lists received from 365 colleges and universities. The mail survey produced a 62-percent response rate (8,779 bachelor's- and 1,033 master's-degree recipients). Data were collected on the following types: Age, citizenship, sex, ethnicity, education, employment, work activity—including relationship to Federal R&D efforts—and salary. Complete data concerning the 1976 sample can be found in:

Westat Research Corp., "The Methodological Approach to the 1976 New Entrants Survey," January 1977. Available from NTIS as PB 265-682.

1978 Sample

A study is now under way surveying the bachelor's- and master's-degree recipients of the class of 1972 and the class of 1976. This study follows the format of the 1976 survey. Data are not yet available.

Survey Instrument

A copy of the 1978 questionnaire is reproduced on the following pages. All of the items will be converted to machine (computer)-readable form except those that have pen lines drawn through them.

Reference

The following NSF report is based on the data above:

"Employment Patterns of Recent Entrants Into Science

and Engineering," *Reviews of Data on Science Resources*, No. 32 (NSF 78-310). Available from NSF and GPO

Data Access

Detailed machine (computer)-readable forms can

be obtained, subject to reproduction costs and official regulations (e.g., Privacy Act of 1976), from:

Mr. J. James Brown
Division of Science Resources Studies
National Science Foundation (L-611)
Washington, D.C. 20550
202/634-4664

NATIONAL SCIENCE FOUNDATION

WASHINGTON, D.C. 20550

August 1978

Dear Graduate:

We need your help in a major national study of the occupational experiences of graduates in Science and Engineering who have been in the labor market for several years. This project, sponsored by the National Science Foundation and the U.S. Department of Energy, will obtain information from a scientifically chosen sample of 13,000 persons who earned Bachelor's or Master's degrees between July 1, 1971 and June 30, 1972. The sample consists of graduates in engineering and natural, physical, or social science. You are one of those chosen to be in this study.

The purpose of this study is to compile national statistics which will allow an appraisal of the employment and educational characteristics of scientists and engineers graduating in 1971/72.

The resulting information will permit the Federal Government, universities and others to formulate science policies and programs and to make evaluations with regard to the science and engineering manpower potential of the nation.

The questionnaire on the following pages will take about 10-15 minutes of your time to complete, and a postage-paid envelope addressed to Westat, Inc. is enclosed for its return. Westat, Inc. has been selected by the National Science Foundation to assist in carrying out this survey.

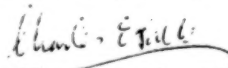
We wish you to know that your completed questionnaire will be seen only by the immediate research staff and will be used for statistical purposes only. In compliance with the Privacy Act of 1974, no personally identifying information will be released to anyone.

We think you will find it interesting and invite your comments on the questionnaire items. In addition, if you have any questions on the survey or need any assistance in completing the questionnaire, please call (collect) Mr. Mark Waksberg or Mr. George K. Schueller at (301) 881-5310.

It would be of great help if you would complete and return the questionnaire within the next five days. If possible, we suggest that you do it now, while you have it in hand. We believe the importance of the study will justify the time you give to it.

The National Science Foundation and the U.S. Department of Energy would greatly appreciate your cooperation in this survey.

Very truly yours,



Charles E. Falk, Director
Division of Science Resources Studies

This information is solicited under the authority of the National Science Foundation Act of 1950, as amended. All information you provide will be treated as confidential and will be used for statistical purposes only. Information will be released only in the form of statistical summaries from which it will be impossible to identify information about any particular person. Your response is entirely voluntary and your failure to provide some or all of the requested information will in no way adversely affect you.

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1978 SURVEY OF RECENT SCIENCE AND ENGINEERING GRADUATES

NATIONAL SCIENCE FOUNDATION AND THE U.S. DEPARTMENT OF ENERGY

DEGREE AND EMPLOYMENT SPECIALTY LIST

Use this list for questions 8 and 15. Find the number corresponding to the appropriate major field and mark it in the space provided in the questionnaire.

AGRICULTURAL SCIENCE

- 001 Agronomy
- 002 Animal/Dairy/Poultry Science
- 003 Horticulture
- 004 Range Management
- 005 Forestry
- 006 Other Agricultural Sciences

BIOLOGICAL SCIENCE

- 007 Anatomy and Histology
- 008 Bacteriology
- 009 Biochemistry
- 010 Biology, General
- 011 Biophysics
- 012 Botany, Plant Pathology
- 013 Entomology
- 014 Genetics
- 015 Immunology
- 016 Marine Science
- 017 Microbiology
- 018 Physiology
- 019 Zoology
- 020 Nutrition (excluding Home Economics)
- 021 Pharmacology
- 022 Other Biological Science

ENGINEERING

- 023 Aeronautical, Aerospace, Astronautical
- 024 Agricultural
- 025 Architectural
- 026 Ceramic
- 027 Chemical
- 028 Civil
- 029 Electrical or Electronic
- 030 Environmental, Sanitary
- 031 General
- 032 Geological
- 033 Industrial
- 034 Mechanical
- 035 Metallurgical, Materials
- 036 Mining
- 037 Nuclear
- 038 Operations Research, Systems
- 039 Petroleum
- 040 Technology (Bachelor's level)
- 041 Other Engineering

PHYSICAL SCIENCE, MATHEMATICAL SCIENCE

- 042 Astronomy
- 043 Atmospheric Science (Meteorology)
- 044 Chemistry
- 045 Computer Science and Data Processing
- 046 Earth Science (Geology, Geophysics)
- 047 Geography
- 048 Mathematics
- 049 Oceanography
- 050 Physics
- 051 Statistics
- 052 Other Physical Sciences

SOCIAL SCIENCE

- 053 Anthropology
- 054 Economics, all fields
- 055 Linguistics
- 056 Political Science (including Government, International Relations)
- 057 Public Administration
- 058 Psychology (all fields except Clinical)
- 059 Social Work, all fields
- 060 Sociology
- 061 Criminology
- 062 Urban Studies
- 063 Other Social Science

ARTS AND HUMANITIES

- 064 Art, Fine and Applied
- 065 English (Language and Literature)
- 066 Foreign Language and Literature
- 067 History
- 068 Journalism, all fields
- 069 Music, all fields
- 070 Philosophy, all fields
- 071 Other Arts and Humanities

BUSINESS

- 072 Accounting
- 073 Business Administration, General
- 074 Finance
- 075 Marketing and Sales
- 076 Management, all fields
- 077 Secretarial Studies
- 078 Other Business

EDUCATION

- 079 Art or Music Education
- 080 Biological Science Education
- 081 Business Education
- 082 Elementary Education
- 083 Engineering Education
- 084 Mathematics Education
- 085 Physical Education or Recreation
- 086 Physical Sciences Education
- 087 Secondary Education
- 088 Science Education, Other
- 089 Special Education
- 090 Other Education

OTHER PROFESSIONS, TECHNICAL FIELDS

- 091 Architecture or Urban Planning
- 092 Clinical Psychology
- 093 Drafting or Design, all fields
- 094 Home Economics
- 095 Health Technology (Medical, Dental, Lab)
- 096 Dentistry
- 097 Medicine or Pre-Medicine
- 098 Nursing
- 099 Pharmacy
- 100 Other Health Professions
- 101 Law or Pre-Law
- 102 Library or Archival Science
- 103 Religion
- 104 Other

OTHER

- 105 Building Trades
- 106 Communications (Radio, TV)
- 107 Crafts (Skilled), all fields
- 108 Law Enforcement
- 109 Machine Operation
- 110 Military Science
- 111 Other, not elsewhere classified

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OMB NO. 995 - 76016

Expires March 1979

1978 SURVEY OF RECENT SCIENCE AND ENGINEERING GRADUATES

NATIONAL SCIENCE FOUNDATION AND THE U.S. DEPARTMENT OF ENERGY

1. Date of Birth Mo. Day Year	2. Citizenship USA 1 ☐ Non-USA 2 ☐ (Specify country): _____	3. Sex Male 1 ☐ Female 2 ☐	9. How many years of professional work experience, including teaching, have you had? (Professional experience includes those work activities in which you have been engaged requiring knowledge of your field at the baccalaureate or equivalent background.) Years																													
4. What is your racial background? American Indian or Alaska native 1 ☐ Asian or Pacific Islander 2 ☐ Black 3 ☐ White 4 ☐			4a. Is your ethnic heritage Hispanic? Hispanic origin ... 1 ☐ Not of Hispanic origin ... 2 ☐																													
5. What is your marital status? Single, never married 1 ☐ Go to 6 Separated, divorced, or widowed 2 ☐ Married 3 ☐			PLEASE NOTE that in items 10-22 information is requested for the current year as of the week of <u>August 7, 1978</u>.																													
5a. Do you have any children? No .. 1 ☐ Yes, under age 6 2 ☐ Yes, 6 years of age or over 3 ☐			10. What was your employment status as of the period indicated? (Check only ONE category.) Employed full-time, science or engineering-related position 1 ☐ Go to 11 Employed full-time, nonscience or nonengineering-related position 2 ☐ Go to 10a Employed part-time, science or engineering-related position 3 ☐ Go to 10b Employed part-time, nonscience or nonengineering-related position 4 ☐ Go to 10b Postdoctoral appointment (fellowship, traineeship, research associateship, etc.) 5 ☐ Go to 11 Unemployed and seeking employment 6 ☐ Go to 10a Not employed and not seeking employment 7 ☐ Go to 10e Retired and not employed 8 ☐ Go to 23 Other (Specify): 9 ☐ Go to 11																													
6. Are you physically handicapped? Yes 1 ☐ No 2 ☐ Go to 7			10a. If you were employed full-time during the week of <u>August 7, 1978</u>, in a position unrelated to science or engineering, what was the MOST important reason for taking the position? Prefer nonscience or nonengineering position 1 ☐ Promoted out of science or engineering position 2 ☐ Pay is better 3 ☐ Go to 11 Locational preference 4 ☐ Science or engineering position not available 5 ☐ Other (Specify): 6 ☐																													
6a. What is the nature of your handicap(s)? (Mark as many as apply.) Visual 1 ☐ Auditory 2 ☐ Orthopedic 3 ☐ Other (Specify): 4 ☐			10b. If you were employed part-time during the week of <u>August 7, 1978</u>, were you seeking full-time employment? Yes 1 ☐ No 2 ☐ Go to 11																													
7. Which of the following best describes your enrollment status as of the week of <u>August 7, 1978</u>? (Mark one only.) Not a student 1 ☐ Graduate student (post baccalaureate) 2 ☐ Full-time 2 ☐ Part-time 3 ☐ Undergraduate student 4 ☐			10c. If you were unemployed and seeking employment during the week of <u>August 7, 1978</u>, was your job search restricted by: Geographic location 1 ☐ Family responsibilities 2 ☐ Need for part-time employment 3 ☐ Other (Specify): 4 ☐																													
8. List in the table below all undergraduate and graduate degrees, excluding honorary degrees, that have been awarded to you. Please use Specialty List on page 2 for major field and number. <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th rowspan="2">Type of Degree</th> <th colspan="2">Granted</th> <th colspan="2">Major Field (Use Specialty List)</th> </tr> <tr> <th>Month</th> <th>Year</th> <th>Name</th> <th>Number</th> </tr> </thead> <tbody> <tr> <td>Bachelor's</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Master's</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Doctorate</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Other (Specify)</td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>			Type of Degree	Granted		Major Field (Use Specialty List)		Month	Year	Name	Number	Bachelor's					Master's					Doctorate					Other (Specify)					10d. How many weeks, during the period of unemployment ending with the week of <u>August 7, 1978</u>, were you unemployed and seeking work? Weeks Go to 23
Type of Degree	Granted			Major Field (Use Specialty List)																												
	Month	Year	Name	Number																												
Bachelor's																																
Master's																																
Doctorate																																
Other (Specify)																																

10e. If you were not employed and not seeking work during the week of August 7, 1978, what was the most important reason for not seeking work?

- | | | | |
|--|---|--------------------------|------------|
| Full-time graduate student | 1 | ☐ | } Go to 23 |
| Temporarily absent for health or personal reasons | 2 | ☐ | |
| Tending to family responsibilities .. | 3 | ☐ | |
| Could not find work or believed no job available in my field | 4 | ☐ | |
| Insufficient financial incentive | 5 | ☐ | |
| On layoff | 6 | ☐ | |
| Other (Specify): | 7 | ☐ | |

11. Which category below best describes the type of organization of your principal employment during the week of August 7, 1978? (Check only ONE category.)

- | | | |
|---|----|--------------------------|
| Business or industry | 01 | ☐ |
| Junior college, 2-year college, technical institute | 02 | ☐ |
| Medical school | 03 | ☐ |
| Four-year college or university other than medical school | 04 | ☐ |
| Elementary or secondary school system | 05 | ☐ |
| Hospital or clinic | 06 | ☐ |
| U.S. military service, active duty, or Commissioned Corps, e.g., USPHS, NOAA | 07 | ☐ |
| U.S. government, civilian employee | 08 | ☐ |
| State government | 09 | ☐ |
| Local or other government (Specify): | 10 | ☐ |
| International agency | 11 | ☐ |
| Nonprofit organization, other than hospital, clinic, or educational institution | 12 | ☐ |
| Other (Specify): | 13 | ☐ |

12. Please give the name of your principal employer (organization, company, etc., or if self-employed, write "self"), and actual place of employment during the week of August 7, 1978.

Name of Employer

City State

13. What percent of working time did you devote to each of the following activities during the week of August 7, 1978?

	Percent
Management or administration of research and development	01
Management or administration of other than research and development	02
Teaching and training -- preparing and teaching courses, guiding and counseling students or trainees	03
Basic research	04
Applied research	05
Development -- product, process, and technical development	06
Report and technical writing, editing, information retrieval	07
Clinical diagnosis	08
Design -- of equipment, processes, models ..	09
Quality control, testing, evaluation, or inspection	10
Operations -- production, maintenance, construction, installation	11
Distribution -- sales, traffic, purchasing, customer and public relations	12
Statistical work -- survey work, forecasting, statistical analysis	13
Consulting	14
Computer applications	15
Other activities (Specify):	16

Total 100%

14. Among all the activities marked above, which was your primary and which was your major secondary activity? (Fill in the appropriate code numbers -- 01 to 16 -- from Q. 13.)

Primary work activity ☐☐

Major secondary work activity ☐☐

15. From the Degree and Employment Specialties List on page 2, select and enter both the number and title of the specialty most closely related to your principal employment during the week of August 7, 1978. Please write in your specialty if it is not on the list.

Number	Type of Specialty

16. What was the basic annual salary* associated with your principal professional employment during the week of August 7, 1978?

\$ per year

**NOTE: Basic annual salary is your annual salary before deductions for income tax, social security, retirement, etc., but does not include bonuses, overtime, summer teaching, or other payment for professional work.*

- 16a. Were you academically employed? Yes ... 1 ☐ Go to 16b and 16c
No 2 ☐ Go to 17

- 16b. Check whether salary was for: 9-10 months 1 ☐
11-12 months 2 ☐

- 16c. What was the title of your position?

Professor	1	☐
Associate professor	2	☐
Assistant professor	3	☐
Instructor	4	☐
Lecturer	5	☐
Teaching assistant	6	☐
Research assistant	7	☐
Other (Specify):	8	☐

17. Was any of your work in the week of August 7, 1978 supported by U.S. government funds? Yes ... 1 ☐ Go to 17a
No 2 ☐ Go to 18
Don't know... 3 ☐

- 17a. IF YES to 17, which of the following federal agencies or departments were supporting the work? (Check all that apply.)

Agency for International Development	01	☐
Environmental Protection Agency	02	☐
National Aeronautics and Space Administration	03	☐
National Endowment for the Arts	04	☐
National Endowment for the Humanities	05	☐
National Science Foundation	06	☐
Nuclear Regulatory Commission	07	☐
Smithsonian Institution	08	☐
Department of Agriculture	09	☐
Department of Commerce	10	☐
Department of Defense	11	☐
Department of Energy	12	☐
Department of Health, Education, and Welfare:		
National Institutes of Health	13	☐
Alcohol, Drug Abuse, and Mental Health Administration	14	☐
National Institutes of Education	15	☐
Office of Education	16	☐
Other (Specify):	17	☐
Department of Housing and Urban Development ..	18	☐
Department of the Interior	19	☐
Department of Justice	20	☐
Department of Labor	21	☐
Department of State	22	☐
Department of Transportation	23	☐
Other agency or department (Specify):	24	☐
Don't know source agency	25	☐

18. Listed below are selected topics of critical national interest. If you devoted a significant proportion of your professional time to any of these problem areas in the week of August 7, 1978, please check the box for the ONE on which you spent the MOST time.

Energy and fuel	01	☐	Go to 19
Health	02	☐	
Defense	03	☐	Go to 23
Environmental protection, pollution control	04	☐	
Education	05	☐	
Space	06	☐	
Crime prevention and control	07	☐	
Food and other agricultural products	08	☐	
Natural resources, other than fuel or food	09	☐	
Community development and services ..	10	☐	
Housing (planning, design, construction)	11	☐	
Transportation, communications	12	☐	
Cultural life	13	☐	
Other area (Specify):	14	☐	
Does not apply	88	☐	

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19. Please check your best estimate of the percent of your professional time during the week of August 7, 1978 that was devoted to energy and fuel.

100 percent	1	☐
75 to 99 percent	2	☐
50 to 74 percent	3	☐
25 to 49 percent	4	☐
24 percent or less	5	☐

20. From the list below, check the ONE energy source that involved the LARGEST proportion of your energy-related work during the week of August 7, 1978.

Coal and coal products	01	☐
Petroleum (including oil shale and tar sands)	02	☐
Natural gas	03	☐
Fission	04	☐
Fusion	05	☐
Hydroenergy	06	☐
Direct solar (including space and water heating, thermal, electric)	07	☐
Indirect solar (winds, tides, biomass, etc.)..	08	☐
Geothermal	09	☐
Other (Specify):	10	☐

21. Please read the following list of energy-related activities and check the item(s) that best describe the activity(ies) in which you were engaged during the week of August 7, 1978. (Check all that apply.)

Exploration	01	☐
Extraction (gas, oil, mining)	02	☐
Manufacture of energy-related components or products	03	☐
Fuel processing (including refining and enriching)	04	☐
Electric power generation	05	☐
Transportation, transmission, distribution of fuel or energy	06	☐
Energy storage	07	☐
Energy utilization, management	08	☐
Fuel reprocessing or disposal	09	☐
Energy conservation	10	☐
Environmental impact (health, economic, etc.)..	11	☐
Education, training	12	☐
Other (Specify):	13	☐

22. Please enter the number of the activity from the above list that best describes the activity in which you spent most of your energy-related time. (Fill in the appropriate code numbers -- 01 to 13 -- from Q. 21.)

--	--

23. Thank you for completing this questionnaire. Please return the completed form in the enclosed postage-paid envelope.

If you have any comments on the content of this questionnaire, please state them here.

Foreign Scientists and Engineers

Purpose

As indicated in earlier sections, it is the aim of the Division of Science Resources Studies to model the Nation's S/E human resources by adding new entrants to the field since 1970. In addition to the new "entrants" to these fields from training programs discussed earlier, immigration provides a major source of S/E population. For this reason, NSF obtains yearly data from the U.S. Immigration and Naturalization Service on two classes of foreign individuals entering the country neither as students or tourists. These two classes of individuals differ only with respect to whether U.S. citizenship is sought.

Samples

Data are obtained from the U.S. Immigration and Naturalization Service of the Department of State on all nontourist, foreign-born scientists, engineers, and physicians entering the United States in each year according to their intentions to seek citizenship, i.e., immigrant or nonimmigrant. These data are in two files: (a) Immigrant Professional, Technical & Kindred Workers and (b) Nonimmigrant Scientists and Engineers, Physicians and Surgeons. Annual data are available for the years since fiscal year 1965. In addition, a special survey was conducted in 1970 by the Census Bureau (U.S. Department of Commerce) for NSF. This survey included a sample of S/E immigrants then in the United States (as opposed to those entering in a particular year). Its purpose was primarily to determine the reasons for immigration and a comparative view of working conditions both here and abroad. The survey collected socio-demographic and labor market data—such as age, sex, marital status, residences, publications, educational history, employment history, and international mobility including reasons for emigrating.

References

The following are publications issued since 1970 by NSF and based primarily on the data described below.

Scientists, Engineers, and Physicians From Abroad

FY 1970: (NSF 72-312)

FY 1972: *Science Resources Studies Highlights* (NSF 73-311). Available from NSF

FY 1973: *Science Resources Studies Highlights* (NSF

74-302). Available from NSF

Scientists and Engineers From Abroad

1966-75: *Reviews of Data on Science Resources* (NSF 77-305). Available from NSF and GPO

Immigrant Scientists and Engineers in the United States.

A Study of Characteristics and Attitudes (NSF 73-302).

Available from NSF, GPO, and NTIS (PB 223 173)

Data Access

The following tape files based on data from the U.S. Immigration and Naturalization Service are available from NSF.

A. All Immigrant Scientists, Engineers, Physicians, and Surgeons, fiscal years 1976 and 1977. The tape file includes: Occupational specialty; country of birth; country of last permanent residence; age; sex; change from the nonimmigrant status by year of entry and former nonimmigrant category; State of intended residence; status as professor or instructor; and type of immigrant visa.

B. Selected Nonimmigrant Scientists, Engineers, Physicians, and Surgeons grouped by like characteristics, fiscal years 1976 and 1977. This tape file includes: Occupational specialty; country of birth; country of last permanent residence; status as professor or instructor; half-year of entry; and nonimmigrant category. The nonimmigrant categories are H-1, temporary workers of distinguished merit and ability; H-2, temporary workers performing services unavailable in the United States; H-3 industrial trainees; J-1, exchange visitors, and L-1, intracompany transfers.

These tapes are available, subject to reproduction cost and official regulations (e.g., Privacy Act of 1976) from:

Mr. Joseph Gannon
Division of Science Resource Studies
National Science Foundation (L-611)
Washington, D.C. 20550
202/634-4655

Data for years prior to fiscal year 1976 are not available in machine (computer)-readable form. Previously prepared cross tabulations of the variables specified above may be obtained in printed form for the years 1966 to 1977 on the same basis as magnetic tapes.

Doctorate Records File: Survey of Earned Doctorates Awarded in the U.S.

Purpose

The Doctorate Records File is a virtually complete listing of the 569,300 recipients of an earned doctorate since 1920. The file includes research doctorates in all fields, except those holding professional (clinical) degrees such as M.D., D.D.S., or D.V.M.

The record for each doctorate recipient includes basic information of interest to policy analysts, planners, and others in the Federal Government, the general educational community, and employers. The record includes information on sociodemographic characteristics, education and postgraduation plans. Sociodemographic characteristics include items such as date and place of birth, sex, marital status, citizenship, racial or ethnic group, education of parents, and number of dependents. Educational information includes high school and date of graduation, colleges attended with dates, fields of study and degrees, title of dissertation and field, and kind and sources of support during graduate study. Postgraduation plans include information on further education or employment. Many items of information, however, are available only since 1957 or, for racial or ethnic data, since 1973.

The Doctorate Records File is compiled from an annual survey (Survey of Earned Doctorates Awarded in the United States) conducted by the National Academy of Sciences under Federal sponsorship. The questionnaire is distributed with the cooperation of deans of graduate schools. Each survey requests information from all new recipients of the Ph.D. or equivalent degree (e.g., Ed.D.). The response rate to the questionnaire has been approximately 95 percent. Nonrespondents are individually represented in the Doctorate Records File by skel-

eton entries obtainable from commencement programs, graduation lists, and other similar public records. It is important to note that File entries for early Ph.D.'s (1920-57 inclusive) were developed from commencement programs, and similar sources as well as entries for nonrespondents.

Survey Instrument

A copy of the most recent survey instrument is reproduced on the following pages. All items are in machine (computer)-readable form except those that have pen lines drawn through them.

References

Summary data from each survey since 1967 are available in a series of annual publications, *Summary Report—Doctorate Recipients from U.S. Universities*, National Academy of Sciences. In addition, a recent major report of interest is *A Century of Doctorates*, National Academy of Sciences, 1978. A limited number of copies are available from the Division of Science Resources Studies, NSF.

Data Access

Additional data in the form of lists, tabulations, and computer tapes are available subject to the limitations of the Privacy Act. Information on the availability of data and costs may be obtained from:

Mrs. Dorothy Gilford
National Academy of Sciences
2101 Constitution Ave., N.W.
Washington, D.C. 20418
(202/389-6697)



Conducted by
The National Research Council
in Cooperation with
The American Council of Learned Societies,
The Social Science Research Council, and
The Graduate Deans

Supported by
The National Science Foundation,
The U.S. Office of Education,
The National Endowment for the Humanities, and
The National Institutes of Health

To the Doctoral Candidate:

This is a brief description of the Survey of Earned Doctorates indicating how the resulting data are used and the individual confidentiality of data is protected. The basic purpose of this Survey is to gather objective data about doctoral graduates, data that are often helpful in improving graduate education. We ask your cooperation with the project.

The information requested on the accompanying questionnaire is largely self-explanatory. Please complete it, detach it along the perforated line, and return it to your Graduate Dean. On the back of this sheet is a Specialties List with code numbers and titles for classifying your fields of specialization. This will be useful in connection with several items on the questionnaire. If none of the detailed fields listed seems to be appropriate, note the "General" and "Other" categories.

What is the Survey of Earned Doctorates?

The Survey is conducted annually by the Commission on Human Resources of the National Research Council in cooperation with the American Council of Learned Societies and the Social Science Research Council. The form is distributed with the cooperation of the Graduate Deans and filled out by all graduates who have completed requirements for their doctoral degrees. Research doctorates in all fields are included, but professional degrees such as the MD, DDS, and DVM are not included because information about recipients of those degrees is compiled elsewhere. The cumulative file goes back to 1920 and is called the Doctorate Records File.

The use of the doctoral data has been increasing, partly because of the implications for graduate education stemming from the change in the growth pattern of the number of persons receiving doctorates (562 in 1920; 2,278 in 1940; 9,735 in 1960; 29,497 in 1970; peaking at 33,727 in 1973; and now at 32,923 in 1976). This survey attempts to supply some of the information as of the time the doctorate is received.

What uses are made of the Survey data?

The data collected by this survey questionnaire become part of the Doctorate Records File maintained by the Commission on Human Resources of the National Research Council. The Survey data are collected with the intention that they will be put to use, but only under carefully defined conditions. Such data as the number of degrees awarded in each field of specialization, the educational preparation of degree recipients, their sources of financial support, the length of time required to attain the degree, and postdoctoral employment plans of doctorate recipients are of great interest to graduate schools, employers, the scholarly community, and the nation generally. The Doctorate Records File is used for a limited number of carefully defined, follow-up research studies. Each year a sample of doctorate recipients is selected for inclusion in a longitudinal research file maintained for the National Science Foundation, the National Institutes of Health, and the National Endowment for the Humanities.

Statistical summaries from the Doctorate Records File are used by educational institutions, professional societies, and government agencies. Some specific examples are:

- An extensive statistical summary of the data is published and distributed to all graduate schools about every five years.⁽¹⁾ These reports have been widely used by graduate schools and states to evaluate their progress in providing doctoral education. The data may also be useful to graduate students as an aid in selecting a graduate department.
- Annual reports containing statistical summaries based on the most recent year's Survey are distributed to graduate schools, government agencies, and any others on request.⁽²⁾

The confidentiality of Survey data is carefully protected.

This information is solicited under the authority of the National Science Foundation Act of 1950, as amended. All information you provide will be treated as confidential and will be used for statistical purposes only. Information will be released only in the form of statistical summaries or in a form which does not identify information about any particular person. There are only two exceptions to this policy: (1) information (name, year, and field of degree) is released to institutions from which you received degrees and to other organizations as part of the address search procedure for follow-up research studies; and (2) information from your form will be made available to the institution where you receive your doctoral degree. This latter release of information is contingent upon receipt of a signed statement from the institution that the information will be used only for internal purposes. Your response is entirely voluntary and your failure to provide some or all of the information will in no way adversely affect you.

(1) National Academy of Sciences, *Doctorate Recipients from United States Universities, 1958-1966*, Washington, D. C., 1967.

(2) National Academy of Sciences, *Summary Report 1976, Doctorate Recipients from United States Universities*, Washington, D. C., March, 1977.

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SPECIALTIES LIST

MATHEMATICS

- 000 Algebra
- 010 Analysis & Functional Analysis
- 020 Geometry
- 030 Logic
- 040 Number Theory
- 050 Probability & Math. Statistics (see also 544, 670, 725, 727, 920)
- 060 Topology
- 080 Computing Theory & Practice
- 082 Operations Research (see also 478)
- 085 Applied Mathematics
- 098 Mathematics, General
- 099 Mathematics, Other*

COMPUTER SCIENCES

- 079 Computer Sciences* (see also 437)

ASTRONOMY

- 101 Astronomy
- 102 Astrophysics

PHYSICS

- 110 Atomic & Molecular
- 120 Electromagnetism
- 132 Acoustics
- 134 Fluids
- 135 Plasma
- 136 Optics
- 138 Thermal
- 140 Elementary Particles
- 150 Nuclear Structure
- 160 Solid State
- 198 Physics, General
- 199 Physics, Other*

CHEMISTRY

- 200 Analytical
- 210 Inorganic
- 220 Organic
- 230 Nuclear
- 240 Physical
- 250 Theoretical
- 260 Agricultural & Food
- 270 Pharmaceutical
- 275 Polymer
- 298 Chemistry, General
- 299 Chemistry, Other*

EARTH, ENVIRONMENTAL AND MARINE SCIENCES

- 301 Mineralogy, Petrology
- 305 Geochemistry
- 310 Stratigraphy, Sedimentation
- 320 Paleontology
- 330 Structural Geology
- 341 Geophysics (Solid Earth)
- 350 Geomorph. & Glacial Geology
- 391 Applied Geol., Geol. Engr. & Econ. Geol.
- 395 Fuel Tech. & Petrol. Engr. (see also 479)
- 360 Hydrology & Water Resources
- 370 Oceanography
- 397 Marine Sciences, Other*

- 381 Atmospheric Physics and Chemistry
- 382 Atmospheric Dynamics
- 383 Atmospheric Sciences, Other*
- 388 Environmental Sciences, General (see also 480, 528)
- 389 Environmental Sciences, Other*
- 398 Earth Sciences, General
- 399 Earth Sciences, Other*

ENGINEERING

- 400 Aeronautical & Astronautical
- 410 Agricultural
- 415 Biomedical
- 420 Civil
- 430 Chemical
- 435 Ceramic
- 437 Computer
- 440 Electrical
- 445 Electronics
- 450 Industrial
- 455 Nuclear
- 460 Engineering Mechanics
- 465 Engineering Physics
- 470 Mechanical
- 475 Metallurgy & Phys. Met. Engr.
- 476 Systems Design & Systems Science
- 478 Operations Research (see also 082)
- 479 Fuel Tech. & Petrol. Engr. (see also 395)
- 480 Sanitary & Environmental
- 486 Mining
- 497 Materials Science
- 498 Engineering, General
- 499 Engineering, Other*

AGRICULTURAL SCIENCES

- 500 Agronomy
- 501 Agricultural Economics
- 502 Animal Husbandry
- 503 Food Science & Technology
- 504 Fish & Wildlife
- 505 Forestry
- 506 Horticulture
- 507 Soils & Soil Science
- 510 Animal Science & Animal Nutrition
- 511 Phytopathology
- 518 Agriculture, General
- 519 Agriculture, Other*

MEDICAL SCIENCES

- 522 Public Health & Epidemiology
- 523 Veterinary Medicine
- 526 Nursing
- 527 Parasitology
- 528 Environmental Health
- 534 Pathology
- 536 Pharmacology
- 537 Pharmacy
- 538 Medical Sciences, General
- 539 Medical Sciences, Other*

BIOLOGICAL SCIENCES

- 540 Biochemistry

- 542 Biophysics
- 544 Biometrics & Biostatistics (see also 050, 670, 725, 727, 920)
- 545 Anatomy
- 546 Cytology
- 547 Embryology
- 548 Immunology
- 550 Botany
- 560 Ecology
- 562 Hydrobiology
- 564 Microbiology & Bacteriology
- 566 Physiology, Animal
- 567 Physiology, Plant
- 569 Zoology
- 570 Genetics
- 571 Entomology
- 572 Molecular Biology
- 576 Nutrition and/or Dietetics
- 578 Biological Sciences, General
- 579 Biological Sciences, Other*

PSYCHOLOGY

- 600 Clinical
- 610 Counseling & Guidance
- 620 Developmental & Gerontological
- 630 Educational
- 635 School Psychology
- 641 Experimental
- 642 Comparative
- 643 Physiological
- 650 Industrial & Personnel
- 660 Personality
- 670 Psychometrics (see also 050, 544, 725, 727, 920)
- 680 Social
- 688 Psychology, General
- 699 Psychology, Other*

SOCIAL SCIENCES

- 700 Anthropology
- 708 Communications*
- 710 Sociology
- 720 Economics (see also 501)
- 725 Econometrics (see also 050, 544, 670, 727, 920)
- 727 Statistics (see also 050, 544, 670, 725, 920)
- 740 Geography
- 745 Area Studies*
- 751 Political Science
- 752 Public Administration
- 755 International Relations
- 770 Urban & Reg. Planning
- 798 Social Sciences, General
- 799 Social Sciences, Other*

HUMANITIES

- 802 History & Criticism of Art
- 804 History, American
- 805 History, European
- 806 History, Other*
- 807 History & Philosophy of Science
- 808 American Studies
- 809 Theatre and Theatre Criticism
- 830 Music
- 831 Speech as a Dramatic Art (see also 885)

- 832 Archeology
- 833 Religion (see also 881)
- 834 Philosophy
- 835 Linguistics
- 836 Comparative Literature
- 878 Humanities, General
- 879 Humanities, Other*

LANGUAGES & LITERATURE

- 811 American
- 812 English
- 821 German
- 822 Russian
- 823 French
- 824 Spanish & Portuguese
- 826 Italian
- 827 Classical*
- 829 Other Languages*

EDUCATION

- 900 Foundations: Social & Philosoph.
- 910 Educational Psychology
- 908 Elementary Educ., General
- 909 Secondary Educ., General
- 918 Higher Education
- 919 Adult Educ. & Extension Educ.
- 920 Educ. Meas. & Stat.
- 929 Curriculum & Instruction
- 930 Educ. Admin. & Superv.
- 940 Guid., Couns., & Student Pers.
- 950 Special Education (Gifted, Handicapped, etc.)
- 960 Audio-Visual Media

TEACHING FIELDS

- 970 Agriculture Educ.
- 972 Art Educ.
- 974 Business Educ.
- 976 English Educ.
- 978 Foreign Languages Educ.
- 980 Home Economics Educ.
- 982 Industrial Arts Educ.
- 984 Mathematics Educ.
- 986 Music Educ.
- 988 Phys. Ed., Health, & Recreation
- 989 Reading Education
- 990 Science Educ.
- 992 Social Science Educ.
- 993 Speech Education
- 994 Vocational Educ.
- 996 Other Teaching Fields*
- 998 Education, General
- 999 Education, Other*

OTHER

PROFESSIONAL FIELDS

- 881 Theology (see also 833)
- 882 Business Administration
- 883 Home Economics
- 884 Journalism
- 885 Speech & Hearing Sciences (see also 831)
- 886 Law & Jurisprudence
- 887 Social Work
- 891 Library & Archival Science
- 897 Professional Field, Other*

899 OTHER FIELDS*

* Identify the specific field in the space provided on the questionnaire.

Please print or type.

A. Name in full: (9-30)
 (Last Name) (First Name) (Middle Name)

Cross Reference: Maiden name or former name legally changed (3)

~~2. Permanent address through which you could always be reached (Give all applicable):~~

.....

(Number) (Street) (City)

.....

(State) (Zip Code) (Or Country if not U.S.)

C. U.S. Social Security Number: _____ (32-40)

D. Date of birth: Place of birth:
(41-45) (Month) (Day) (Year) (46-47) (State) (Or Country if not U.S.)

E. Sex: 1 ☐ Male 2 ☐ Female (48)

F. Marital status: 1 ☐ Married 2 ☐ Not married (including widowed, divorced) (4)

G. Citizenship: 0 ☐ U.S. native 2 ☐ Non U.S., Immigrant (Permanent Resident)
1 ☐ U.S. naturalized 3 ☐ Non-U.S., Non-Immigrant (Temporary Resident) (\$0)
If Non-U.S., indicate country of present citizenship (\$1-\$2)

H. Racial or ethnic group: (Check all that apply.) *A person having origins in—*

0 ☐ American Indian or Alaskan Native any of the original peoples of North America, and who maintain cultural identification through tribal affiliation or community recognition.

1 ☐ Asian or Pacific Islander any of the original peoples of the Far East, Southeast Asia, the Indian Subcontinent, or the Pacific Islands. This area includes, for example, China, Japan, Korea, the Philippine Islands, and Samoa.

2 ☐ Black, not of Hispanic Origin any of the black racial groups of Africa.

3 ☐ White, not of Hispanic Origin any of the original peoples of Europe, North Africa, or the Middle East.

4 ☐ Hispanic Mexican, Puerto Rican, Central or South American, or other Spanish culture or origins, regardless of race.

(53-55)

1. Number of dependents: Do not include yourself. (Dependent = someone receiving at least one half of his or her support from you) (56)

J. U.S. veteran status: 0 ☐ Veteran 1 ☐ On active duty 2 ☐ Non-veteran or not applicable (57)

EDUCATION

K. High school last attended: (School Name) (City) (State) (58-59)

Year of graduation from high school: (60-61)

L. List in the table below all collegiate and graduate institutions you have attended including 2-year colleges. List chronologically, and include your doctoral institution as the last entry.

[illegible]

4b. ~~Enter below the title of your doctoral dissertation and the most appropriate classification number and field. If a project report or a technical or literary composition that a dissertation is a degree requirement, please check box.~~ ☐ (44)

Title	Classify using Specialties List	
	Number	Name of field
.....		
.....		
.....		
.....		

~~4. Name the department (or interdisciplinary committee, center, institute, etc.) and school or college of the university which supervised your doctoral program.~~

~~C. Name of your dissertation advisor~~ (Last Name) (First Name) (Middle Initial)

continued on next page

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SURVEY OF EARNED DOCTORATES, Cont.

P. Please enter a "1" beside your primary source of support during graduate study. Enter a "2" beside your secondary source of support during graduate study. Check all other sources from which support was received.

- | | | | |
|--|--|--|----------------------------|
| 58 — NSF Fellowship | 66 — GI Bill | 72 — Research Assistantship | 76 — Spouse's earnings |
| 59 — NSF Traineeship | 67 — Other Federal support (specify) | 73 — Educational fund of industrial or business firm | 77 — Family contributions |
| 60 — NIH Fellowship | 68 — Woodrow Wilson Fellowship | 74 — Other institutional funds (specify) | 78 — Loans (NDSL direct) |
| 61 — NIH Traineeship | 69 — Other U.S. national fellowship | 75 — Own earnings | 79 — Other loans |
| 62 — NDEA Fellowship | 70 — University Fellowship | | 80 — Other (specify) |
| 63 — Other HEW | 71 — Teaching Assistantship | | |
| 64 — AEC/ERDA Fellowship (specify) | | | |
| 65 — NASA Traineeship | | | |

Q. Please check the space which most fully describes your status during the year immediately preceding the doctorate.

- | | | |
|--|--|--|
| 0 ☐ Held fellowship | Full-time
Employed in:
(Other than
0, 1, 2) | 5 ☐ College or university, teaching |
| 1 ☐ Held assistantship | | 6 ☐ College or university, non-teaching |
| 2 ☐ Held own research grant | | 7 ☐ Elem. or sec. school teaching |
| 3 ☐ Not employed | | 8 ☐ Elem. or sec. school, non-teaching |
| 4 ☐ Part-time employed | | 9 ☐ Industry or business |
| | | (11) ☐ Other (specify) |
| | | (12) ☐ Any other (specify) (9) |

R. How many years (full-time equivalent basis) of professional work experience did you have prior to the doctorate? (include assistantships as professional experience) (10-11)

S. How well defined are your postgraduation plans?

- 0 ☐ Have signed contract or made definite commitment
- 1 ☐ Am negotiating with a specific organization, or more than one
- 2 ☐ Am seeking appointment but have no specific prospects
- 3 ☐ Other (specify) (12)

T. What are your immediate postgraduation plans?

- 0 ☐ Postdoctoral fellowship?
- 1 ☐ Postdoctoral research associateship?
- 2 ☐ Traineeship?
- 3 ☐ Other study (specify) } Go to Item "U"
- 4 ☐ Employment (other than 0, 1, 2, 3) } Go to Item "V"
- 5 ☐ Military service?
- 6 ☐ Other (specify) (13)

U. If you plan to be on a postdoctoral fellowship, associateship, traineeship or other study

What will be the field of your postdoctoral study?

- | Number | Classify using Specialties List. | Field |
|--------|----------------------------------|---------------|
| | | (14-16) |

What will be the primary source of support?

- 0 ☐ U.S. Government
- 1 ☐ College or university
- 2 ☐ Private foundation
- 3 ☐ Nonprofit, other than private foundation
- 4 ☐ Other (specify) (17)
- 6 ☐ Unknown
- Go to Item "W"

W. What is the name and address of the organization with which you will be associated?

(Name of Organization)

(Street) (City, State) (Or Country if not U.S.) (24-29)

X. Please indicate, by circling the highest grade attained, the education of

your father:	none	1 2 3 4 5 6 7 8	9 10 11 12	1 2 3 4	MA, MD PhD	Postdoctoral (30)
		Elementary school	High school	College	Graduate	
your mother	none	1 2 3 4 5 6 7 8	9 10 11 12	1 2 3 4	MA, MD PhD	Postdoctoral (31)
	0	1 2 3	4 5	6 7	8 9	(11)

Signature Date completed (32-34)

National Survey of Doctorate Recipients

Purpose

The primary objective of this continuing biennial survey is to estimate at the national level the supply and utilization of doctoral scientists and engineers. One use of these data is to modify the main sample of scientists and engineers drawn from the 1970 Census.

This survey is unique in that the sample is drawn from a complete enumeration of doctorate-holders. During 1972 a roster was compiled of all known recipients of doctoral degrees for the years 1930-72, inclusive. The completed Comprehensive Roster of Doctoral Scientists and Engineers, encompassing this particular 42-year span, was used as the population for the initial survey conducted in 1973. Subsequent surveys were, and continue to be, conducted at 2-year intervals (e.g., 1975 and 1977). For each succeeding survey the 42-year population definition is maintained by adding the two most recent graduating classes and dropping the oldest two cohort-year groups. For example, the 1975 survey covered doctorate recipients in the period January 1, 1932 to June 30, 1974, while the 1977 survey spans the 1934-76 population.

1973 Sample

The 1973 survey was based on the Comprehensive Roster of approximately 272,000 doctorate-holders from which a stratified sample of approximately 59,000 was selected. Individuals included in the 1973 roster were stratified according to the following variables: (1) U.S. S/E doctorate-holders; foreign S/E doctorate-holders; non-S/E doctorates subsequently employed in S/E position; (2) sex; (3) size of graduating institution according to the annual number of doctorates awarded; (4) field of doctorate; and (5) year of doctorate. The survey yielded an overall response rate of approximately 75 percent or 42,456 of those contacted.

1975 Sample

For the 1975 survey a stratified sample of approximately 66,800 was selected. The stratification plan was the same as that for the 1973 survey except

that "size of graduating institution" was replaced by a different variable—"racial/ethnic identification." Note that these *racial/ethnic* data are only available beginning with the 1973 cohort group. This survey also yielded an overall response rate of approximately 75 percent or 43,442 of those contacted.

1977 Sample

The 1977 survey was based on a similarly stratified sample of approximately 68,500.

Survey Instrument

A copy of the 1977 questionnaire begins at the end of this text. All items are in machine (computer)-readable form except those that have pen lines drawn through them.

References

Complete sampling details and selected data are available in the following NSF publications:

Characteristics of Doctoral Scientists and Engineers in the United States

1973: (NSF 75-312). Available from NSF, GPO, and NTIS (PB 248 655)

Tables. (NSF 75-312A). Available from NSF and NTIS (PB 248 656)

1975: (NSF 77-309). Available from NSF, GPO, and NTIS (PB 272 873)

1977: *Tables*. (NSF 79-306). Available from NSF

Data Access

Additional data in the form of lists, tabulations and machine (computer)-readable tapes are available subject to the limitations of the Privacy Act as well as cost. Information on the availability of data and costs may be obtained from:

Dr. Betty Maxfield
Commission on Human Resources
National Research Council of National Academy of Sciences
2101 Constitution Avenue, N.W.
Washington, D.C. 20418
202/389-6528

1977 SURVEY OF DOCTORATE RECIPIENTS

CONDUCTED BY THE NATIONAL RESEARCH COUNCIL WITH THE SUPPORT OF THE NATIONAL SCIENCE FOUNDATION,
THE NATIONAL ENDOWMENT FOR THE HUMANITIES, AND THE NATIONAL INSTITUTES OF HEALTH

THE ACCOMPANYING LETTER requests your assistance in this biennial survey of Ph.D.'s in the humanities, sciences, and engineering.
PLEASE READ the instructions for each question carefully and answer by printing your reply or checking the appropriate box.
PLEASE CHECK the pre-printed information to be certain that it is correct and complete.

PLEASE RETURN the completed form in the enclosed envelope to the Commission on Human Resources, JH 638, National Research Council, 2101 Constitution Avenue, N.W., Washington, D.C. 20418.

NOTE: THIS INFORMATION IS SOLICITED UNDER THE AUTHORITY OF THE NATIONAL SCIENCE FOUNDATION ACT OF 1950, AS AMENDED. ALL INFORMATION YOU PROVIDE WILL BE TREATED AS CONFIDENTIAL AND USED FOR STATISTICAL PURPOSES ONLY. INFORMATION WILL BE RELEASED ONLY IN THE FORM OF STATISTICAL SUMMARIES OR IN A FORM WHICH DOES NOT IDENTIFY INFORMATION ABOUT ANY PARTICULAR PERSON. YOUR RESPONSE IS ENTIRELY VOLUNTARY AND YOUR FAILURE TO PROVIDE SOME OR ALL OF THE REQUESTED INFORMATION WILL IN NO WAY ADVERSELY AFFECT YOU.

If your name and address are incorrect, please enter correct information above. Include ZIP CODE

If there is an alternate address through which you can always be reached, please provide it on the line below.

(10)

C/O		Number Street		City	State	ZIP Code (11)
1. Date of Birth Mo. Day Year (12-16)	2. State or Foreign Country of Birth (17-18)	3. Citizenship 0 ☐ U.S.A. 1 ☐ Non-U.S.A., Specify Country _____ (19) (20-21)			4. Sex 1 ☐ M 2 ☐ F (22)	
5. What is your racial background? 0 ☐ American Indian or Alaskan Native 1 ☐ Asian or Pacific Islander 2 ☐ Black 3 ☐ White (23)				5a. Is your ethnic heritage Hispanic? 0 ☐ Yes 1 ☐ No (24)		

6. List in the table below all collegiate and graduate degrees, excluding honorary degrees, that have been awarded to you. Please check the pre-printed information, including the number and name of the specialty from the list on page 4, to be certain that it is correct and complete.

Type of Degree	Granted Mo. Yr.	Major Field (Use Specialties List) Name Number	Institution Name	City (or Campus) & State
Bachelor's				
Master's				
Doctorate				
Other (Specify)				

7. What was your employment status as of February 6-12, 1977?
(Check only one category.)

- Employed full-time in field of Ph.D. ☐ 1
 Employed full-time in field other than field of Ph.D. ☐ 2
 Employed part-time ☐ 3
 Were you seeking full-time employment?
 1 ☐ Yes 2 ☐ No (66)
 Postdoctoral appointment (fellowship, traineeship,
 research associateship, etc.) ☐ 4
 Unemployed and seeking employment ☐ 5
 Not employed and not seeking employment ☐ 6
 Retired and not employed ☐ 7
 Other, specify: ☐ 8
 (65)

7a. If you were employed full-time during February 6-12, 1977, in a field other than your field of Ph.D., what was the MOST important reason for taking the position?

- Preferred position outside Ph.D. field ☐ 1
 Promoted out of position in Ph.D. field ☐ 2
 Better pay ☐ 3
 Locational factors ☐ 4
 Position in Ph.D. field not available ☐ 5
 Other, specify: ☐ 6
 (67)

If you checked 5, 6 or 7, ANSWER ONLY 8a, 9a, 13, 14 and 17 of the following questions.

8. Which category below best describes the type of organization of your principal employment OR postdoctoral appointment during February 6-12, 1977?
(Check only one category.)

- | | | | |
|---|----------------------------|---|-----------------------------|
| Business or industry | ☐ 1 | Hospital or clinic | ☐ 10 |
| Junior college, 2 year college, technical institute | ☐ 2 | U.S. military service, active duty, or Commissioned Corps,
e.g., USPHS, NOAA | ☐ 11 |
| Medical school | ☐ 3 | U.S. government, civilian employee | ☐ 12 |
| 4-Year college | ☐ 4 | State government | ☐ 13 |
| University other than medical school | ☐ 5 | Local or other government, specify | ☐ 14 |
| Elementary or secondary school system | ☐ 6 | Non-profit organization, other than those listed above | ☐ 15 |
| Private foundation | ☐ 7 | Other, specify | ☐ 16 |
| Museum or historical society | ☐ 8 | | |
| Research library or archives | ☐ 9 | | |

(68-69)

8a. Which of the above categories best describes the type of organization related to your first position following the receipt of your doctorate?
(List only one category.)

Type of Organization (70-71)

9. What percent of time did you devote to each of the following activities during the week of February 6-12, 1977? (Total should equal 100%)
What were your primary (A) and secondary (B) work activities? (Check only one in each column.)

	%	A	B
Management or administration of			
Research and development	(10)	☐ 1	☐
Other than research and development	(12)	☐ 2	☐
Both	(14)	☐ 3	☐
Basic research	(16)	☐ 4	☐
Applied research	(18)	☐ 5	☐
Development of equipment, products, systems, data	(20)	☐ 6	☐
Development of humanities resource materials	(22)	☐ 7	☐
Design	(24)	☐ 8	☐
Teaching	(26)	☐ 9	☐
Writing, editing	(28)	☐ 10	☐
Curatorial	(30)	☐ 11	☐
Production	(32)	☐ 12	☐
Consulting, specify	(34)	☐ 13	☐
Professional services to individuals	(36)	☐ 14	☐
Quality control, inspection, testing	(38)	☐ 15	☐
Sales, marketing, purchasing, estimating	(40)	☐ 16	☐
Other, specify	(42)	☐ 17	☐
Total = 100%		(44-47)	

9a. Which of the above categories best describes the primary work activity related to your first position following the receipt of your doctorate?

10. From the Degree and Employment Specialties List on page 4 select and enter both the number and title of the employment specialty most closely related to your principal employment or postdoctoral appointment during the week of February 6-12, 1977. Write in your specialty if it is not on the list

Number Title of Employment Specialty (50-52)

11. Please give the name of your principal employer (organization, company, etc. or, if self employed, write "self"), and actual place of employment as of the week of February 6-12, 1977.

Name of Employer (53-58)

Number Street

City State ZIP Code (59-63)

12. What was the basic annual salary* associated with your principal professional employment during the week of February 6-12, 1977? If you were on a postdoctoral appointment (e.g., fellowship, traineeship, research associateship), what was your annual stipend plus allowances?

\$ per year (64-66)

*NOTE: Basic annual salary is your annual salary before deductions for income tax, social security, retirement, etc., but does not include bonuses, overtime, summer teaching, or other payment for professional work.

IF ACADEMICALLY EMPLOYED:

a. Check whether salary was for ☐ 9-10 months or ☐ 11-12 months. (67)

b. Did you hold a tenured position during February 6-12, 1977?

0 ☐ Yes 1 ☐ No (68)

If Yes, what year was tenure granted?

(69-70)

c. What was the rank of your position? (Check only one.)

- 1 ☐ Professor
2 ☐ Associate Professor
3 ☐ Assistant professor

- 4 ☐ Instructor
5 ☐ Lecturer
6 ☐ Other, specify:

(71)

d. What, if any, administrative position did you hold?

- 1 ☐ Dean
2 ☐ Department Chairman
3 ☐ President or Chancellor

- 4 ☐ Vice-President or Vice-Chancellor
5 ☐ Other, specify:
6 ☐ Does not apply

(72)

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13. How many full-time equivalent years of professional work experience, including teaching, have you had? _____ Year(s)
(73-74)

14. Following completion of your doctorate have you ever held a fellowship, traineeship, or research associateship? 0 ☐ Yes 1 ☐ No
(75)

15. Listed below are selected topics of national interest. If you devoted a proportion of your professional time which you considered significant to any of these problem areas during the week of February 6-12, 1977, please check the box for the one on which you spent the MOST time.

- | | | |
|--|---|--|
| 1 ☐ Health | 6 ☐ Crime prevention and control | 11 ☐ Housing (planning, design, construction) |
| 2 ☐ Defense | 7 ☐ Energy and fuel | 12 ☐ Transportation, communications |
| 3 ☐ Environmental protection, pollution control | 8 ☐ Food and other agricultural products | 13 ☐ Cultural life |
| 4 ☐ Education | 9 ☐ Natural resources, other than fuel or food | 14 ☐ Other area, specify: _____ |
| 5 ☐ Space | 10 ☐ Community development and services | 15 ☐ Does not apply |

(10-11)

16. Was any of your work in the week of February 6-12, 1977 supported or sponsored by U.S. Government funds?

0 ☐ Yes

1 ☐ No

2 ☐ Don't know

(12)

If Yes, which of the following federal agencies or departments were supporting the work? (Check all that apply.)

- 13 ☐ Agency for International Development
14 ☐ Energy Research & Development Administration
15 ☐ Environmental Protection Agency
16 ☐ National Aeronautics & Space Administration
17 ☐ National Endowment for the Arts
18 ☐ National Endowment for the Humanities
19 ☐ National Science Foundation
20 ☐ Nuclear Regulatory Commission
21 ☐ Smithsonian Institution
22 ☐ Department of Agriculture
23 ☐ Department of Commerce
24 ☐ Department of Defense

Department of Health, Education, and Welfare

- 25 ☐ National Institutes of Health
26 ☐ Alcohol, Drug Abuse & Mental Health Administration
27 ☐ National Institute of Education
28 ☐ Office of Education
29 ☐ Other, specify: _____
30 ☐ Department of Housing and Urban Development
31 ☐ Department of the Interior
32 ☐ Department of Justice
33 ☐ Department of Labor
34 ☐ Department of State
35 ☐ Department of Transportation
36 ☐ Other agency or department, specify: _____
37 ☐ Don't know source agency

17. If you received your doctoral degree in science or engineering or are employed as a scientist or engineer, please check all that apply below:

- ☐ (a) Changed positions during the period 1973 to 1976
☐ (b) Received doctoral degree in 1965 or later and employed sometime since receiving your doctoral degree in industry, government, or as non-faculty academic staff
☐ (c) Held a postdoctoral appointment any year during 1970-1976 inclusive.
☐ (d) None of the above apply

(38-41)

If you have checked a, b, or c, please give a brief career history starting with the position prior to your present position and continuing back in time for a maximum of four positions after receiving your doctoral degree (Include postdoctoral appointments).

Name and Location (City and State) of Employer	Position Title	Dates Held	Primary Work Activity*	Employment Specialty (Use Degree & Employment Specialties List)	Reason for Leaving Position
1. _____					
2. _____					
3. _____					
4. _____					

*Enter code (1-17) from the list given in item 9

(a) Of the positions described above, as well as your present position, please check any in which your doctoral training was/is not being used.

- ☐ Position 1 ☐ Position 2 ☐ Position 3 ☐ Position 4 ☐ Present Position ☐ None

(74-79)

DEGREE AND EMPLOYMENT SPECIALTIES LIST

MATHEMATICAL SCIENCES

- 000 Algebra
- 010 Analysis & Functional Analysis
- 020 Geometry
- 030 Logic
- 040 Number Theory
- 052 Probability
- 055 Math. Statistics (see also 544, 670, 725, 729)
- 060 Topology
- 062 Operations Research (see also 478)
- 065 Applied Mathematics
- 089 Combinatorics & Finite Mathematics
- 091 Physical Mathematics
- 098 Mathematics, General
- 099 Mathematics, Other*

COMPUTER SCIENCES

- 071 Theory
- 072 Software Systems
- 073 Hardware Systems
- 074 Intelligent Systems
- 079 Computer Sciences, Other

PHYSICS & ASTRONOMY

- 101 Astronomy
- 102 Astrophysics
- 110 Atomic & Molecular Physics
- 120 Electromagnetism
- 130 Mechanics
- 132 Acoustics
- 134 Fluids
- 135 Plasma Physics
- 136 Optics
- 138 Thermal Physics
- 140 Elementary Particles
- 150 Nuclear Structure
- 150 Solid State
- 198 Physics, General
- 199 Physics, Other*

CHEMISTRY

- 200 Analytical
- 210 Inorganic
- 215 Synthetic Inorganic & Organometallic
- 220 Organic
- 225 Synthetic Organic & Natural Products
- 230 Nuclear
- 240 Physical
- 245 Quantum
- 250 Theoretical
- 255 Structural
- 260 Agricultural & Food
- 265 Thermodynamics & Material Properties
- 270 Pharmaceutical
- 275 Polymers
- 280 Biochemistry (see also 540)
- 285 Chemical Dynamics
- 298 Chemistry, General
- 299 Chemistry, Other*

EARTH, ENVIRONMENTAL AND MARINE SCIENCES

- 301 Mineralogy, Petrology
- 305 Geochemistry
- 310 Stratigraphy, Sedimentation
- 320 Paleontology
- 330 Structural Geology
- 341 Geophysics (Solid Earth)
- 350 Geomorph. & Glacial Geology
- 391 Applied Geol., Geol. Engr. & Econ. Geol.
- 395 Fuel Tech. & Petrol. Engr. (see also 479)
- 360 Hydrology & Water Resources
- 370 Oceanography
- 397 Marine Sciences, Other*
- 381 Atmospheric Physics & Chemistry
- 382 Atmospheric Dynamics
- 383 Atmospheric Sciences, Other*
- 388 Environmental Sciences, General (see also 480, 528)
- 399 Environmental Sciences, Other*
- 398 Earth Sciences, General
- 399 Earth Sciences, Other*

ENGINEERING

- 400 Aeronautical & Astronautical
- 410 Agricultural
- 415 Biomedical
- 420 Civil
- 430 Chemical
- 435 Ceramic
- 440 Electrical
- 445 Electronics
- 450 Industrial & Manufacturing
- 455 Nuclear
- 460 Engineering Mechanics
- 465 Engineering Physics
- 470 Mechanical
- 475 Metallurgy & Phys. Met. Engr.
- 476 Systems Design & Systems Science (see also 072, 073, 074)
- 478 Operations Research (see also 082)
- 479 Fuel Technology & Petrol. Engr.
- 480 Sanitary & Environmental
- 486 Mining
- 497 Materials Science Engr.
- 498 Engineering, General
- 499 Engineering, Other*

AGRICULTURAL SCIENCES

- 500 Agronomy
- 501 Agricultural Economics
- 502 Animal Husbandry
- 504 Fish & Wildlife
- 505 Forestry
- 506 Horticulture
- 507 Soils & Soil Science
- 510 Animal Science & Animal Nutrition
- 511 Phytopathology
- 517 Food Science & Technology (see also 573)
- 518 Agriculture, General
- 519 Agriculture, Other*

MEDICAL SCIENCES

- 520 Medicine & Surgery
- 522 Public Health & Epidemiology
- 523 Veterinary Medicine
- 524 Hospital Administration
- 526 Nursing
- 527 Parasitology
- 528 Environmental Health
- 534 Pathology
- 536 Pharmacology
- 537 Pharmacy
- 538 Medical Sciences, General
- 539 Medical Sciences, Other*

BIOLOGICAL SCIENCES

- 540 Biochemistry (see also 280)
- 542 Biophysics
- 543 Biomathematics
- 544 Biometrics, Biostatistics (see also 055, 670, 725, 729)
- 545 Anatomy
- 546 Cytology
- 547 Embryology
- 548 Immunology
- 550 Botany
- 560 Ecology
- 562 Hydrobiology
- 564 Microbiology & Bacteriology
- 566 Physiology, Animal
- 567 Physiology, Plant
- 569 Zoology
- 570 Genetics
- 571 Entomology
- 572 Molecular Biology
- 573 Food Science & Technology (see also 517)
- 574 Behavior/Ethology
- 576 Nutrition & Dietetics
- 578 Biological Sciences, General
- 579 Biological Sciences, Other*

PSYCHOLOGY

- 600 Clinical
- 610 Counseling & Guidance
- 620 Developmental & Gerontological
- 630 Education
- 635 School Psychology
- 641 Experimental
- 642 Comparative
- 643 Physiological
- 650 Industrial & Personnel
- 660 Personality
- 670 Psychometrics (see also 055, 544, 725, 729)
- 680 Social
- 698 Psychology, General
- 699 Psychology, Other*

SOCIAL SCIENCES

- 700 Anthropology
- 703 Archeology
- 708 Communications*
- 709 Linguistics
- 710 Sociology
- 720 Economics (see also 501)
- 725 Econometrics (see also 055, 544, 670, 729)
- 729 Social Statistics (see also 055, 544, 670, 725)
- 740 Geography
- 745 Area Studies*
- 751 Political Science
- 752 Public Administration
- 755 International Relations
- 770 Urban & Regional Planning
- 775 History & Philosophy of Science
- 798 Social Sciences, General
- 799 Social Sciences, Other*

HUMANITIES

- 802 History & Criticism of Art
- 804 History, American
- 805 History, European
- 806 History, Other*
- 808 American Studies
- 830 Music
- 831 Speech as a Dramatic Art (see also 885)
- 833 Religion (see also 881)
- 834 Philosophy
- 836 Comparative Literature
- 878 Humanities, General
- 879 Humanities, Other*
- 891 Library & Archival Sciences

LANGUAGES & LITERATURE

- 811 American
- 812 English
- 821 German
- 822 Russian
- 823 French
- 824 Spanish & Portuguese
- 826 Italian
- 827 Classical*
- 829 Other Languages*

EDUCATION & OTHER PROFESSIONAL FIELDS

- 938 Education
- 801 Art, Applied
- 881 Theology (see also 833)
- 882 Business Administration
- 883 Home Economics
- 884 Journalism
- 885 Speech & Hearing Sciences (see also 831)
- 886 Law, Jurisprudence
- 887 Social Work
- 897 Professional Field, Other*

899 OTHER FIELDS*

*Identify the specific field in the space on the questionnaire

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Federally Employed Scientists and Engineers

Purpose

Data are collected and maintained concerning scientists and engineers as employed by the U.S. Government. These data, when combined with other information resources, provide estimates of the quantity of science personnel employed as well as the method of their utilization in this portion of the public sector; i.e., the Executive Branch of the Federal Government (excluding uniformed military personnel).

Sample

The source of data describing federally employed scientists and engineers is the U.S. Civil Service Commission. As each person is employed, released, or has his/her status changed by an agency of the Federal Government, the employing office is required to notify the U.S. Civil Service Commission using a Standard Form 50. Data from the form include sociodemographic, educational, occupational and minority-status variables that provide the basis for this NSF file and, more recently, for a set of computer-readable tapes.

Currently, only data for 1976-77 accessions and separations are available on computer-readable tape. All future data will be reported to NSF annually for the month of October and the first of these tapes will soon be available. Computer-readable tapes will continue to be prepared on these two bases—accessions and separations. In addition, certain nonmachine-readable data are also available in NSF reports for a period spanning the last 25 years: Numbers employed by sex, intermittent since 1954; salary since 1964; major functions reported biennially since 1969; educational levels first cited in 1974; and a forthcoming report on minority-group participation in the Federal workforce as of 1977.

References

The following are major NSF reports issued since 1970 based on the data cited above:

Federal Scientific, Technical, and Health Personnel
1969: (NSF 70-44)

1970: *Science Resources Studies Highlights* (NSF 71-47)

1971-72: *Science Resources Studies Highlights* (NSF 74-301). Available from NSF

January 1974: *Reviews of Data on Science Resources* (NSF 76-308). Available from NSF, GPO, and NTIS (PB 266 088)

Data Access

The following tape files based on the Central Personnel Datafile (U.S. Civil Service Commission) are available:

A. A tape file of all in-house Federal civilian scientists and engineers employed full time in October 1977. Data on the tape file include: Agency; bureau; year of birth; State-city-county of employment; occupational specialty (series); pay plan; grade and step; salary; service computation date; sex; tenure (career, etc.); minority group designation; highest degree earned and year; field of highest degree; and functional class.

B. A tape file of all new hires (and rehires) of full-time Federal civilian scientists and engineers in calendar 1977. Data include: Age interval; occupational series; grade; salary; sex; minority group designation; highest degree earned and year; and field of highest degree.

C. A tape file of all separations of full-time Federal civilian scientists and engineers in calendar 1977. Data include: Age interval; occupational series; grade; salary; sex; minority-group designation; highest degree earned and year; and field of highest degree.

These tapes are available subject to restrictions (e.g., Privacy Act of 1976) and reproduction cost from:

Mr. Joseph Gannon
Division of Science Resources Studies
National Science Foundation
1800 G Street, N.W. L-611
Washington, D.C. 20550
202/634-4655

Survey of Scientific and Technical Personnel in Private Industry

Purpose

This survey, for 1977-78, is an NSF effort to compile national estimates of employment by detailed industry, occupation, and function (e.g., research), from the Occupational Employment Survey of the Bureau of Labor Statistics (BLS), U.S. Department of Labor. Similar, but not strictly comparable, time-series data are available from NSF for 1950-70 period and for 1975. The 1950-70 series was collected by BLS from intermittent direct surveys of samples of establishments between 1950 and 1970 with interpolation made for intervening years. The 1975 estimates were made by the Bureau of the Census from a sample of 24,000 establishments and included data on energy personnel.

1977-78 Sample

The sample consists of 116,000 manufacturing establishments surveyed in 1977 and 217,000 non-manufacturing establishments being surveyed in mid-1978. Stratification is based on the 3-digit SIC industry code, by size of establishment and State. A response rate in excess of 75 percent is expected. Data for the 1977 survey are available from SRS. Tapes may be obtained from BLS for national data and from selected States for geographic data. It is expected that the 1978 survey results will be available in mid-1979.

References

Data for the 1950-70 time series are:

Employment of Scientists and Engineers

1950-70: (Bulletin 1781). Available from Bureau of Labor Statistics, Department of Labor

The following are NSF reports based on the Census data:

Scientific and Technical Personnel in Private Industry
1960-70 and 1975: *Reviews of Data on Science Resources* (NSF 78-302). Available from NSF and GPO

1965-77: *Science Resources Studies Highlights* (NSF 79-307). Available from NSF

Data Access

Data tapes for the Survey of Scientific and Technical Personnel in Industry are available for the years 1977 and 1978.

Tapes may be obtained from:

Mr. Brian MacDonald
U.S. Department of Labor
Bureau of Labor Statistics
GAO Building
441 G St., N.W.
Washington, D.C. 20212
(Phone: 202-523-1636)

Cost of tape: Actual copying cost (approximately \$50.00)

Survey of Scientific and Engineering Personnel Employed at Universities and Colleges

Purpose

The academic employment survey has collected data from January 1969 through January 1978 on both full- and part-time scientists and engineers (including academic faculty, postdoctorals, and other professionals) by field of employment and primary function. A distribution of the full-time-equivalent (FTE) totals was collected for the three possible activities or functions—teaching, research and development, and other activities. Data have also been collected on the highest earned degree of both full- and part-time S/E personnel by primary function, and for full-time personnel only, by sex, beginning in 1974. Separate data are available on S/E technicians for the entire 1969–78 time series. The biennial full-scale survey containing these items is mailed to all institutions of higher education—including doctorate, master's, bachelor's, and 2-year institutions—that are believed to offer degree-credit courses in the sciences and engineering. The survey is not mailed to schools of art, music, theology, and specialized institutions without programs in the sciences and engineering.

Survey Instrument

Revisions to the current full-scale survey format used in January 1978 have been aimed primarily at the reduction in respondent burden by use of an abbreviated version in alternate years that will be mailed to doctorate-granting institutions only. Beginning in January 1979 only selected data items will be collected—those that are considered essential to the maintenance of the time series. These will consist of headcounts of full- and part-time S/E employment by discipline, a distribution of total employment in FTE terms, and the FTE involvement of persons engaged in separately budgeted R&D activities, in a similar format to item 6 as shown on page 45. The full-scale survey of all academic institutions will resume on January 1980 on a biennial basis; its contents are currently under review. A copy of the 1978 full-scale survey instrument follows.

References

The following NSF publications contain analyses of the results of the most recent academic employment surveys:

Manpower Resources for Scientific Activities at Universities and Colleges

January 1974: *Tables* (NSF 75-300A). Available from NTIS (PB 243 128)

Science Resources Studies Highlights (NSF 74-315)

January 1975: (NSF 76-311). Available from NSF, GPO, and NTIS (PB 263 542)

January 1976: (NSF 77-308). Available from NSF, GPO, and NTIS (PB 272 878)

January 1977: *Tables* (NSF 77-321). Available from NSF and NTIS (PB 279 917)

Science Resources Studies Highlights (NSF 77-327). Available from NSF

January 1978: *Tables* (NSF 78-318). Available from NSF

Data Access

Data tapes are currently available for January 1973, January 1974, January 1975, January 1976, January 1977, and January 1978. The survey populations for the available years are as follows:

January 1973—2,198 Academic Institutions; 21 FFRDC's

January 1974—2,204 Academic Institutions; 21 FFRDC's

January 1975—2,204 Academic Institutions; 21 FFRDC's

January 1976—2,184 Academic Institutions; 21 FFRDC's

January 1977—2,169 Academic Institutions; 21 FFRDC's

January 1978—2,166 Academic Institutions; 21 FFRDC's

For further information regarding data tape availability or contents, please contact:

Moshman Associates, Inc.
University Statistics Group
6400 Goldsboro Road
Washington, D.C. 20034
301/229-3000

The cost of the tapes is \$80 per tape for the first five tapes (one survey year on each tape) and \$50 for each additional tape. A *Data User Guide* has been developed for 1973–78 tape users that documents the compatible code structure utilized in NSF's Integrated Data Base—a 4-survey system of academic institutions' R&D personnel and financial resources devoted to science and engineering activities, of which this survey is a part.

NATIONAL SCIENCE FOUNDATION
WASHINGTON, D.C. 20550

**SURVEY OF SCIENTIFIC AND ENGINEERING PERSONNEL
EMPLOYED AT UNIVERSITIES AND COLLEGES, JANUARY
1978**

INSTRUCTIONS AND DEFINITIONS

The National Science Foundation requests your cooperation in completing the attached questionnaire covering the personnel characteristics of your institution as they relate to the sciences and engineering. This form requests employment data as of January 1978. The questionnaire should be completed and returned to NSF by March 31, 1978. If you determine, however, that you will not be able to respond by that date, please notify NSF and request an extension of time.

This survey is similar to that conducted by this office each year. The major difference this year is the deletion of the question (formerly item 5) on Ph.D./Sc.D.'s by field and employment status and the removal of the "optional" designation for the item requesting FTE data by field, (formerly item 7).

Where data reported in the current survey differ significantly from those reported in the previous survey, please indicate the reasons for the difference, such as "opening of new medical school," etc., at the end of the questionnaire in the "Remarks" section, or on a separate sheet of paper.

If you have any questions regarding information requested on this form, write or telephone Mr. Robert Loycano at the Universities and Nonprofit Institutions Studies Group, Division of Science Resources Studies, National Science Foundation, 1800 G Street, N.W., Room L-602, Washington, D.C. 20550 (Telephone: 202/634-4673). Additional forms, as well as copies of previous responses, may be obtained by writing to the above address.

Institutions of Higher Education

Academic institutions should include in the form for the parent institution data on

professional and technical personnel employed in the sciences and engineering in all branches and other units of the parent institution. *Include* regional campuses, medical school, or an agricultural experiment station, but *exclude* an associated federally funded research and development center (FFRDC). FFRDC's are to report their data separately from the administering university.

Include all personnel who were paid a salary or stipend, including *postdoctorals*, and other staff, such as members of religious orders, who received no remuneration while employed at the institution.

Exclude: (1) Personnel on sabbatical or other leave status; (2) personnel employed in branches of your institution located in foreign countries; (3) unpaid voluntary staff; (4) student health service personnel; and (5) those agricultural extension personnel primarily involved in home economics and 4-H youth programs.

Medical Schools

Incorporate data for medical schools in the data for the parent institution. Medical schools are those 2- or 4-year schools of medicine approved by the Council on Medical Education and Hospitals and the Association of American Medical Colleges. *Include*: (1) Teaching and R&D functions of hospitals or clinics owned, operated, or controlled by universities and integrated operationally with the clinical programs of their medical schools; (2) research bureaus or institutes which are integral parts of medical schools; (3) research bureaus and institutes which are nonuniversity owned but are affiliated with the medical school and any university bureaus, and institutes which may be outside the departmental structure of univer-

sities, but whose senior research staff members hold teaching appointments with medical schools.

Personnel employed at such organizations that are to be reported in the survey include all M.D.'s, D.D.S.'s, etc., with *faculty* or *academic* appointments. Typical among these are physicians, dentists, public health specialists, pharmacists, etc., who spend the *greatest* proportion of their time in teaching, clinical investigation, or other R&D activities.

Exclude: (1) All medical practitioners, interns, residents, and clinical fellows *without* faculty or academic appointments; (2) scientists whose primary employment is at independent hospitals even though they may perform some teaching or research functions for your institution through cooperative agreements; (3) nurses; (4) some allied health professionals primarily involved in direct patient care, such as optometrists, nurse anesthetists, occupational therapists, and physical therapists; and, (5) unpaid voluntary staff at medical or dental schools.

Federally Funded Research and Development Centers (FFRDC's)

For purposes of this survey, FFRDC's are defined as R&D organizations exclusively or substantially financed by the Government and administered on a contractual basis by educational institutions or other organizations. The following is a current list of FFRDC's administered by universities and colleges:

Ames Laboratory
Applied Physics Laboratory (Johns Hopkins University)
Applied Research Laboratory
Argonne National Laboratory
Brookhaven National Laboratory
Center for Naval Analyses
Cerro Tololo Inter-American Observatory
E. O. Lawrence Berkeley Laboratory
E. O. Lawrence Livermore Laboratory
Fermi National Accelerator Laboratory
Jet Propulsion Laboratory
Kitt Peak National Observatory
Lincoln Laboratory
Los Alamos Scientific Laboratory
National Astronomy and Ionosphere Center
National Center for Atmospheric Research
National Radio Astronomy Observatory
Oak Ridge Associated Universities
Plasma Physics Laboratory
Space Radiation Effects Laboratory
Stanford Linear Accelerator Center

Data Elements Required to Complete This Survey

If the following seven characteristics are known for each science and engineering employee, the request can be substantially completed without estimates. The characteristics are further described elsewhere in the instructions.

1. Scope of personnel included:
 - a. Scientists and engineers
 - b. Science and engineering technicians
2. Assignment status:
 - a. Full time
 - b. Part time
3. Field of employment (22 detailed fields in 7 broad groupings)
4. Full-time-equivalents (FTE's)
5. Function:
 - a. Teaching
 - b. Research and development
 - c. Other science and engineering activities
6. Highest earned degree:
 - a. Ph. D. or Sc. D.
 - b. Ed. D.
 - c. M. D., D.D.S., D.V.M., etc.
 - d. Master's
 - e. Bachelor's or its equivalent
7. Classification of scientists and engineers by sex.

Classification of Fields of Employment in the Sciences and Engineering

Listed below are the broad and detailed fields of employment corresponding to those shown on the questionnaire with illustrative disciplines in each field.

Please classify persons (including those employed in interdisciplinary or multidisciplinary specializations) in the listed fields with which their activities (teaching, research, or other) are *most closely identified*. In the case of a scientist employed in a general category such as science education, he should be reported in the field *most closely related* to the academic requirements of his position—such as mathematics, sociology, or psychology.

Because of the importance of academic departments in the organizational structure and, thus, in the information systems of institutions of higher education, many institutions must report individuals in terms of

the departmental assignment shown in their personnel information systems. In some instances, the designated department will not necessarily be the same as the field in which an individual is actually employed.

Because of the departmental structure, it is important that respondents include in the survey organizational units that are not part of any academic department. For example, scientists and engineers employed at a computer center that is not affiliated with a particular academic department should be *included* in the survey.

ENGINEERING

Aeronautical & Astronomical: aerodynamics, aerospace, space technology

Chemical: ceramic, petroleum, petroleum refining process

Civil: architectural, hydraulic, hydrologic, marine, sanitary and environmental, structural, transportation

Electrical: communication, electronic, power

Mechanical: engineering mechanics

Other Engineering: agricultural, industrial and management, metallurgical and materials, mining, nuclear, ocean engineering systems, textile, welding, interdisciplinary fields for the training of technicians.

PHYSICAL SCIENCES

Chemistry: analytical, inorganic, organo-metallic, organic, pharmaceutical, physical, polymer science (exclude biochemistry)

Physics: acoustics, atomic and molecular, condensed matter, elementary particles, nuclear structure, optics, plasma

Other Physical Sciences: astronomy (laboratory astrophysics, optical astronomy, radio astronomy, theoretical astrophysics, X-ray, gamma-ray, neutrino astronomy), metallurgy, interdisciplinary fields for the training of technicians

ENVIRONMENTAL SCIENCES (TERRESTRIAL AND EXTRATERRESTRIAL)

Earth Sciences: engineering geophysics, general geology, geodesy and gravity, geomagnetism, hydrology, inorganic geochemistry, isotopic geochemistry, organic geochemistry, lab geophysics, paleomagnetism, paleontology, physical geography and cartography, seismology

Atmospheric Sciences: aeronomy, solar, weather modification, extraterrestrial atmospheres, meteorology

Oceanography: biological oceanography, chemical oceanography, geological oceanography, physical oceanography, marine geophysics

MATHEMATICAL AND COMPUTER SCIENCES

Mathematics: algebra, analysis, applied mathematics, foundations and logic, geometry, numerical analysis, statistics, topology

Computer Sciences: computer programming,¹ computer and information sciences (general); design, development, and application of computer capabilities to data storage and manipulation; information sciences and systems; systems analysis

LIFE SCIENCES

Agricultural Sciences: agronomy, animal science, dairy science, food science and technology, forestry, horticulture, poultry science

Biological Sciences: anatomy, bacteriology, biochemistry, biogeography, biophysics, ecology, embryology, entomology, evolutionary biology, genetics, immunology, microbiology, nutrition and metabolism, parasitology, pathology, pharmacology, physical anthropology, physiology, plant sciences, radiobiology, systematics, zoology, interdisciplinary fields for the training of technicians

Medical Sciences: Internal medicine, neurology, ophthalmology, preventive medicine and public health, psychiatry, radiology, surgery, veterinary medicine, dentistry, pharmacy, podiatry, anesthesiology, chemotherapy, dermatology, geriatrics, nuclear medicine, obstetrics, gynecology, oncology, pediatrics, physical medicine and rehabilitation, interdisciplinary fields for the training of technicians²

PSYCHOLOGY: animal behavior; clinical psychology; comparative psychology, counseling and guidance; development and personality; educational, personnel, vocational psychology and testing; experimental psychology; ethology; industrial and engineering psychology; social psychology

SOCIAL SCIENCES

Economics: agricultural economics; econometrics and economic statistics; history of economic thought; international economics; industrial, labor and agricultural economics; macroeconomics; microeconomics; public finance and fiscal policy; theory; economic systems and development

Sociology: comparative and historical, complex organizations, culture and social structure, demography, group interactions, social problems and social welfare, sociological theory

Political Science: area or regional studies, comparative government, history of political ideas, international relations and law, national, political and legal systems; political theory, public administration

Other Social Sciences: cultural anthropology, criminology, history of science, linguistics, socioeconomic geography, urban studies, research in education, and research in law, i.e., attempt to assess impact of legal systems and practices on society.

¹ Personnel employed as computer programmers should be reported as technicians (item 7).

² Exclude personnel primarily involved in direct patient care.

Section A—Number of Scientists and Engineers, January 1978

(Includes postdoctorals and excludes graduate students)

This section requests data on full- and part-time employed scientists and engineers. Scientists and engineers include *faculty members, postdoctorals, and other professionals* working in the sciences and engineering at your institution, including those in research administration. These professionals work at a level at which the knowledge acquired by academic training equal to a bachelor's degree is essential in the performance of duties. Graduate students are not considered scientists and engineers for survey purposes.

Two possible criteria used in determining whether an individual is employed full time are (1) his/her working 40 hours per week; or (2) his/her teaching 12 credit hours per week. (The preceding serve as illustrations only; the "full-time" workload may vary somewhat from institution to institution.)

Avoid double counting; if an individual is a full-time employee, but his assignment involves more than 1 department or more than 1 campus, he/she should be counted as 1 full-timer in his/her actual or primary field of employment and at his/her primary campus location.

Item 1. Full-time scientists and engineers, by field and function in which primarily employed, January 1978.

In items 1a to 1h, the functional classification of professional personnel into teaching (column 2), R&D (column 3), and other science and engineering activities (column 4), should be based on the function in which the person is *primarily* engaged or employed at the institution. For example, a person engaged in two or all three of the specified functional categories should be classified in the function in which he spends the *largest* proportion of his time. *Exclude* outside consulting work and teaching not performed under the auspices of your institution.

In classifying personnel by function, note that determinations made solely on the basis of job titles may produce a significant bias primarily toward teaching. It is important to recognize that persons with professorial rank may also be engaged in research.

In classifying an individual under a particular category (teaching, research and development, or other science and engineering activities), take into consideration all official activities even if carried on in a school or department other than the one in which he holds his principal appointment.

Teaching (column 2) is defined as encompassing those activities connected with degree-credit courses or which are intended to lead ultimately to the granting of degrees or certificates or to professional certification or licensing.

Include under "teaching" any academic administrator—such as the President, a Dean, or a department chairman—who holds a science or engineering degree, unless the individual is primarily involved in the administration of R&D activities. If the individual cannot be identified with *one* specific discipline, report the field of his highest earned degree. Administrators primarily involved in R&D activities should be reported in the "R&D" column.

Include personnel engaged in instruction of: first-year trainees, residents, and other professional personnel receiving advanced training such as postdoctoral fellows or trainees.

Time spent by faculty or other staff members in supervising the thesis work of graduate students is considered to be part of the teaching function.

Exclude instructors in nursing programs, dental hygiene, etc., specialties that relate primarily to direct patient care.

Research and development (column 3) includes basic and applied research in the sciences and engineering and design and development of prototypes and processes.

Research is a systematic, intensive study directed toward fuller knowledge of the subject studied. *Research* includes activities that are separately budgeted, including all activities specifically organized to produce research outcomes and commissioned by an agency either external to the institution or separately budgeted by an organizational unit within the institution. This activity includes all

departmental research that is separately budgeted. *Include* in this function the preparation for publication of books and papers describing the results of the specific research and development. Also *include* the administration of research and development.

Development is the systematic use of knowledge directed toward the design and production of useful prototypes, materials, devices, systems, methods, or processes. It does *not* include quality control or routine product testing.

Under *Other science and engineering activities* (column 4) report all professional personnel *not* primarily employed in teaching or research and development, as defined above. Examples of such activities are agricultural demonstration work not specifically excluded on page 1; adult education (if not for degree credit); dissemination of scientific information; and student counseling by individuals with degrees in psychology. *Exclude* hospital employees predominantly involved in patient services, Student Health Service professionals, and other individuals that are *not* primarily engaged in science or engineering activities. *Do not use* this category to report individuals for which there is difficulty in determining their primary function. It is preferable that you classify each person in the most appropriate functional category according to your best estimate.

Full-time-equivalent distribution, by function. In line 1i, apportion staff members across the three functions on the basis of the proportion of effort or time spent in each of the functions, thus correcting for the "primarily engaged" headcount data reported in line 1h. For example, an individual devoting three-fourths of his time to teaching and one-fourth to research and development should be counted as 0.75 in teaching and 0.25 in research and development. The FTE values should then be accumulated for each function. This sum should then be *rounded to the nearest whole number* before entering the total on the questionnaire. In line 1i, totals entered in columns 2, 3, and 4 should add to the total in column 1.

Item 2. Full-time scientists and engineers, by highest earned degree and function in which primarily employed, January 1978.

For the purposes of this survey, earned degrees are classified in five categories:

a. "*Ph.D. or Sc.D.*" degrees (include all such earned degrees.) *Include* individuals holding both the Ph.D. (or Sc.D.) degree and any other doctorate degree.

b. "*Ed.D.*" (includes all such earned degrees.)

c. "*M.D., D.D.S., D.V.M., etc.*" *includes* individuals whose highest earned degrees are first-professional medical degrees that represent the completion of the academic requirements based on programs that require at least 2 academic years of previous college work for entrance and require a total of at least 6 academic years of college work for completion. Specifically include in line 2c first-professional degrees in Medicine (M.D.), Dentistry (D.D.S. or D.M.D.), Veterinary Medicine (D.V.M.), Chiropractic or Podiatry (D.S.C. or D.P.), and Osteopathy (D.O.). Individuals holding both the Ph.D. (Sc.D.) degree and a first-professional degree such as the M.D., should be included in line 2a as mentioned in (a) above.

d. "*Master's*" degrees includes all degrees above the bachelor's and first-professional degree and other than the doctorate degrees reported between lines 2a and 2c.

e. "*Bachelor's or the equivalent*" degrees includes all individuals whose highest earned degree is the bachelor's degree or a 4- or 5-year first-professional degree, or who have the equivalent in experience, even if they have not earned such a degree (line 2e).

Item 3. Part-time scientists and engineers, by field and function in which primarily employed, January 1978.

Instructions for item 1 relating to classification by field and function also relate to part-time professional staff in item 3.

In estimating the full-time-equivalents of part-time personnel in line 3i, take into account both the overall workload and the proportion of time spent on each of the three functions of activity. For example, if full-time workload is 40 hours per week, and an individual is estimated to spend 10 hours on teaching and related duties and 6 hours on research, his FTE values would be teaching—.25 (10/40); R&D—.15 (6/40). The FTE values should be accumulated for each function and *rounded to the nearest whole number* before entering the total on the questionnaire. The FTE values entered in columns 2, 3, and 4 should then be summed to arrive at the total to be entered in column 1.

departmental research that is separately budgeted. *Include* in this function the preparation for publication of books and papers describing the results of the specific research and development. Also *include* the *administration* of research and development.

Development is the systematic use of knowledge directed toward the design and production of useful prototypes, materials, devices, systems, methods, or processes. It does *not* include quality control or routine product testing.

Under *Other science and engineering activities* (column 4) report all professional personnel *not* primarily employed in teaching or research and development, as defined above. Examples of such activities are agricultural demonstration work not specifically excluded on page 1; adult education (if not for degree credit); dissemination of scientific information; and student counseling by individuals with degrees in psychology. *Exclude* hospital employees predominantly involved in patient services, Student Health Service professionals, and other individuals that are *not* primarily engaged in science or engineering activities. *Do not use* this category to report individuals for which there is difficulty in determining their primary function. It is preferable that you classify each person in the most appropriate functional category according to your best estimate.

Full-time-equivalent distribution, by function. In line 1i, apportion staff members across the three functions on the basis of the proportion of effort or time spent in each of the functions, thus correcting for the "primarily engaged" headcount data reported in line 1h. For example, an individual devoting three-fourths of his time to teaching and one-fourth to research and development should be counted as 0.75 in teaching and 0.25 in research and development. The FTE values should then be accumulated for each function. This sum should then be *rounded to the nearest whole number* before entering the total on the questionnaire. In line 1i, totals entered in columns 2, 3, and 4 should add to the total in column 1.

Item 2. Full-time scientists and engineers, by highest earned degree and function in which primarily employed, January 1978.

For the purposes of this survey, earned degrees are classified in five categories:

a. "*Ph.D. or Sc.D.*" degrees (include all such earned degrees.) *Include* individuals holding both the Ph.D. (or Sc.D.) degree and any other doctorate degree.

b. "*Ed.D.*" (includes all such earned degrees.)

c. "*M.D., D.D.S., D.V.M., etc.*" *includes* individuals whose highest earned degrees are first-professional medical degrees that represent the completion of the academic requirements based on programs that require at least 2 academic years of previous college work for entrance and require a total of at least 6 academic years of college work for completion. Specifically include in line 2c first-professional degrees in Medicine (M.D.), Dentistry (D.D.S. or D.M.D.), Veterinary Medicine (D.V.M.), Chiropody or Podiatry (D.S.C. or D.P.), and Osteopathy (D.O.). Individuals holding both the Ph.D. (Sc.D.) degree and a first-professional degree such as the M.D., should be included in line 2a as mentioned in (a) above.

d. "*Master's*" degrees includes all degrees above the bachelor's and first-professional degree and other than the doctorate degrees reported between lines 2a and 2c.

e. "*Bachelor's or the equivalent*" degrees includes all individuals whose highest earned degree is the bachelor's degree or a 4- or 5-year first-professional degree, or who have the equivalent in experience, even if they have not earned such a degree (line 2e).

Item 3. Part-time scientists and engineers, by field and function in which primarily employed, January 1978.

Instructions for item 1 relating to classification by field and function also relate to part-time professional staff in item 3.

In estimating the full-time-equivalents of part-time personnel in line 3i, take into account both the overall workload and the proportion of time spent on each of the three functions of activity. For example, if full-time workload is 40 hours per week, and an individual is estimated to spend 10 hours on teaching and related duties and 6 hours on research, his FTE values would be teaching—.25 (10/40); R&D—.15 (6/40). The FTE values should be accumulated for each function and *rounded to the nearest whole number* before entering the total on the questionnaire. The FTE values entered in columns 2, 3, and 4 should then be summed to arrive at the total to be entered in column 1.

Example

If your institution employs:

20 full-time chemical engineers
 10 part-time chemical engineers
 30

4 full-time electrical engineers
 4 part-time electrical engineers
 8

And:

Of the 20 full-time chemical engineers, 6 have split appointments (50-50 basis) with the electrical engineering department; thus, 14 are employed solely as chemical engineers.

All part-time personnel carry, on the average, one-third the normal workload.

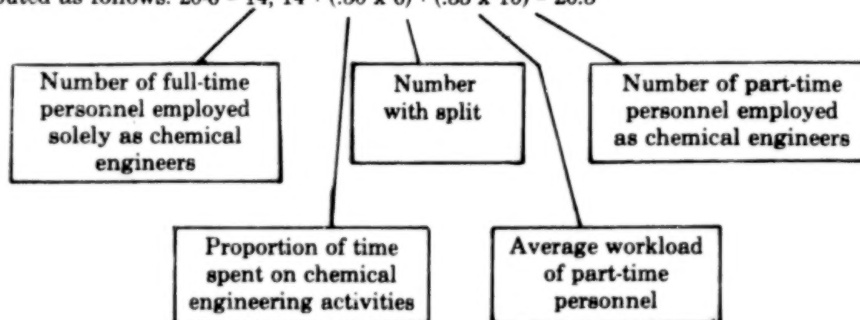
Concerning R&D effort, 12 of the 20 full-time chemical engineers and 2 of the 4 full-time engineers expend, on the average, one-fourth of their time on R&D activities.

Then, the data in lines 2712 (chemical engineers) and 2714 (electrical engineers) should be estimated as follows:

Item 6

Line	Total Headcount (Col. 1)	Full time (Col. 2)	Part time (Col. 3)	Total FTE's (Col. 4)	R&D FTE's (as percent of col. 4) (Col. 5)
2712 (chemical engineers)	30	20	10	¹ 20	³ 15
2714 (electrical engineers)	8	4	4	² 8	⁴ 6

¹ Computed as follows: $20 - 6 = 14$; $14 + (.50 \times 6) + (.33 \times 10) = 20.3$



² Computed as follows: $4 + (.50 \times 6) + (.33 \times 4) = 8.33$

³ Computed as follows: $.25 \times 12 = 3$; $3 \div 20 = .15 = 15\%$

⁴ Computed as follows: $.25 \times 2 = .50$; $.50 \div 8 = .06 = 6\%$

Section B—Number of Technicians Employed in the Sciences and Engineering, January 1978

Item 7. Technicians, by field and function in which *primarily* employed, January 1978.

Technicians include all persons employed in positions which involve technical work at a level requiring knowledge in any of the fields of engineering, mathematics, physical sciences, environmental sciences, life sciences, psychology, or social sciences comparable to that acquired through formal post-high school training (*less than a bachelor's degree*), such as that obtained at technical institutes and junior colleges or through equivalent on-the-job training or experience. All personnel performing the

duties described above should be reported as technicians *even* if they hold a bachelor's or higher degree. Some typical job titles include laboratory technician or assistant, physical science aide, engineering aide, statistical aide, draftsman, and computer programmer.

Exclude graduate students; technicians involved primarily in patient care service in university affiliated hospitals; and craftsmen such as electricians, carpenters, machinists, etc. In the case where undergraduate students, juniors or seniors, are employed in R&D activities, they may, where applicable, be included as technicians.

NATIONAL SCIENCE FOUNDATION
Washington, D.C. 20550

**SURVEY OF SCIENTIFIC AND ENGINEERING PERSONNEL EMPLOYED
AT UNIVERSITIES AND COLLEGES, JANUARY 1978**

Organizations are requested to complete and return this form to:

NATIONAL SCIENCE FOUNDATION
1800 G Street, N.W.
Washington, D.C. 20550 Attn: UNISG

This information is solicited under the authority of the National Science Foundation Act of 1950, as amended. All information you provide will be used for statistical purposes only. Your response is entirely voluntary and your failure to provide some or all of the information will in no way adversely affect your institution.

Name and address of institution:

(Please correct if name or address has changed)

This survey requests employment data as of January 1978. The completed 1978 questionnaire should be returned to NSF by March 31, 1978. Your cooperation in returning the survey questionnaire promptly will be appreciated. If you determine, however, that you cannot respond by March 31, please notify NSF and request an extension of time.

Please read the enclosed instructions before completing this form. If you have any questions about the completion of the form, contact **Robert Loycano (202-634-4673)**. Where exact data are not available, use estimates. Please complete all items; estimates by college officials will be better than NSF estimates. Enter "O" as an item total (lines 2100; 2200, etc., are item totals) rather than leave the total blank.

All entries should be in whole numbers. Please do not enter decimals or fractions, except in column 5 of item 6 where 1 decimal place is optional.

Institutions of Higher Education

Include data for branches (including regional campuses) and all organizational units of your institution, such as a medical school or agricultural experiment station. Also include any hospital or clinic owned, operated, or controlled by the University, and integrated operationally with the clinical programs of your medical school. **Exclude** data for any federally funded research and development centers (FFRDC's) administered by your institution. (See below).

Please classify your institution according to (1) highest degree granted in the sciences or engineering and (2) primary administrative control.

Highest degree granted in the sciences or engineering during 1976-77	Check one	One example of a science or engineering field in which highest degree was awarded	Check primary administrative control of your institution
Ph.D.	☐	_____	Federal ☐
M.D., D.D.S., etc.	☐	_____	State ☐
Master's	☐	_____	Local ☐
Bachelor's or equivalent	☐	_____	Private ☐
Degree other than in science or engineering	☐	_____	
2-year program	☐	_____	

Federally Funded Research and Development Centers (FFRDC's)

Separate forms have been mailed directly to all

FFRDC's administered by academic institutions. A list of these centers appears on page 2 of the Instructions and Definitions.

SECTION A. NUMBER OF SCIENTISTS AND ENGINEERS, JANUARY 1978

(INCLUDE postdoctorals; EXCLUDE graduate students)

Item 1. Full-time scientists and engineers, by field and function in which primarily employed (enter the totals of 1a thru 1g in 1h); and total full-time-equivalents (FTE), by function, January 1978 (enter in 1i)					
FIELD OF EMPLOYMENT		TOTAL (1)	TEACHING (2)	R&D (3)	Other activities (4)
a.	Engineers (total)	2110			
	(1) Aeronautical & astronautical engineers	2111			
	(2) Chemical engineers	2112			
	(3) Civil engineers	2113			
	(4) Electrical engineers	2114			
	(5) Mechanical engineers	2115			
	(6) Other engineers	2116			
b.	Physical scientists (total)	2120			
	(1) Chemists	2121			
	(2) Physicists	2122			
	(3) Other physical scientists	2123			
c.	Environmental scientists (total)	2130			
	(1) Earth scientists	2131			
	(2) Atmospheric scientists	2132			
	(3) Oceanographers	2133			
d.	Mathematical & computer scientists (total)	2140			
	(1) Mathematicians (exclude computer scientists)	2141			
	(2) Computer scientists (exclude programmers)	2142			
e.	Life scientists (total)	2150			
	(1) Agricultural scientists	2151			
	(2) Biological scientists	2152			
	(3) Medical scientists (see instructions, p.1)	2153			
f.	Psychologists (total)	2160			
g.	Social scientists (total) (exclude historians)	2170			
	(1) Economists	2171			
	(2) Sociologists	2172			
	(3) Political scientists	2173			
	(4) Other social scientists	2174			
h.	Total headcount (sum of a thru g) <u>a/</u>	2100			
i.	FTE distribution, by function <u>b/</u>	2190			

Item 2. Full-time scientists and engineers, by highest earned degree and function in which primarily employed, January 1978					
HIGHEST EARNED DEGREE		TOTAL (1)	TEACHING (2)	R&D (3)	Other activities (4)
Doctorate holders, by type					
a.	Ph.D. or Sc.D.	2210			
b.	Ed.D.	2220			
c.	M.D., D.D.S., D.V.M., etc.	2230			
d.	Master's	2240			
e.	Bachelor's or the equivalent	2250			
f.	Total (sum of a thru e)	2200			

a/ Totals in line 1h should be the same as the corresponding totals in line 2f.

b/ The total reported in item 1i, column 1, should, by definition, be the same as the total in item 1h, column 1. However, the FTE distribution by function (columns 2, 3, and 4) will not necessarily coincide with the functional distribution on a "primarily employed" basis in line 1h.

BEST DOCUMENT AVAILABLE

Part-time scientists and engineers, by field and function in which primarily employed (enter the totals of 3a thru 3g in 3h); and total FTE's by function, January 1978 (enter in 3i) (INCLUDE postdoctorals; EXCLUDE graduate students)

FIELD OF EMPLOYMENT		TOTAL (1)	TEACHING (2)	R&D (3)	Other activities (4)
a. Engineers (total)	2310				
(1) Aeronautical & astronautical engineers	2311				
(2) Chemical engineers	2312				
(3) Civil engineers	2313				
(4) Electrical engineers	2314				
(5) Mechanical engineers	2315				
(6) Other engineers	2316				
b. Physical scientists (total)	2320				
(1) Chemists	2321				
(2) Physicists	2322				
(3) Other physical scientists.	2323				
c. Environmental scientists (total)	2330				
(1) Earth scientists	2331				
(2) Atmospheric scientists	2332				
(3) Oceanographers	2333				
d. Mathematical & computer scientists (total)	2340				
(1) Mathematicians (exclude computer scientists)	2341				
(2) Computer scientists (exclude programmers)	2342				
e. Life scientists (total)	2350				
(1) Agricultural scientists	2351				
(2) Biological scientists	2352				
(3) Medical scientists (see instructions, p.1.)	2353				
f. Psychologists (total)	2360				
g. Social scientists (total) (exclude historians)	2370				
(1) Economists	2371				
(2) Sociologists	2372				
(3) Political scientists	2373				
(4) Other social scientists.	2374				
h. Total headcount (sum of a thru g) <u>a/</u>	2300				
i. FTE distribution, by function <u>b/</u>	2390				

Part-time scientists and engineers, by highest earned degree and function in which primarily employed, January 1978

HIGHEST EARNED DEGREE		TOTAL (1)	TEACHING (2)	R&D (3)	Other activities (4)
Doctorate holders, by type					
a. Ph.D. or Sc.D.	2410				
b. Ed.D.	2420				
c. M.D., D.D.S., D.V.M., etc.	2430				
d. Master's	2440				
e. Bachelor's or the equivalent.	2450				
f. Total (sum of a thru e)	2400				

Totals in line 3h should be the same as the corresponding totals in line 4f.

The totals in item 3i converting figures on part-time employment into FTE's will necessarily differ from headcount totals in line 3h.

Item 5	Full-time scientists and engineers, by field in which primarily employed, and sex, January 1978 (Totals reported in item 5, column 1, should equal the totals reported in item 1, column 1.)			
	FIELD OF EMPLOYMENT	TOTAL (1)	MEN (2)	WOMEN (3)
	a. Engineers (total)	2610		
	(1) Aeronautical & astronautical	2611		
	(2) Chemical engineers	2612		
	(3) Civil engineers	2613		
	(4) Electrical engineers	2614		
	(5) Mechanical engineers	2615		
	(6) Other engineers	2616		
	b. Physical scientists (total)	2620		
	(1) Chemists	2621		
	(2) Physicists	2622		
	(3) Other physical scientists	2623		
	c. Environmental scientists (total)	2630		
	(1) Earth scientists	2631		
	(2) Atmospheric scientists	2632		
	(3) Oceanographers	2633		
	d. Mathematical & computer scientists (total)	2640		
	(1) Mathematicians (exclude computer scientists)	2641		
	(2) Computer scientists (exclude programmers)	2642		
	e. Life scientists (total)	2650		
	(1) Agricultural scientists	2651		
	(2) Biological scientists	2652		
	(3) Medical scientists (see instructions, p. 1.)	2653		
	f. Psychologists (total)	2660		
	g. Social scientists (total) (exclude historians)	2670		
	(1) Economists	2671		
	(2) Sociologists	2672		
	(3) Political scientists	2673		
	(4) Other social scientists	2674		
	h. Total headcount (sum of a thru g)	2600		

BEST DOCUMENT AVAILABLE

Scientists and engineers, by field in which primarily employed, employment status, and total full-time equivalents (FTE's) by field, January 1978

NOTE: This information is needed by NSF and others interested in the current status and trends in the level of academic research, by field.

FIELD OF EMPLOYMENT		Headcounts			Estimated full-time-equivalents (FTE)	
		Total (1)	Full time ^a (2)	Part time ^b (3)	Total FTE's (Include all activities, e.g., teaching, R&D etc., of all individuals reported in col. 1) (4)	Percent of total FTE's devoted to R&D (5)
a. Engineers (total)	2710					%
(1) Aeronautical & astronautical engineers	2711					%
(2) Chemical engineers	2712					%
(3) Civil engineers	2713					%
(4) Electrical engineers	2714					%
(5) Mechanical engineers	2715					%
(6) Other engineers	2716					%
b. Physical scientists (total)	2720					%
(1) Chemists	2721					%
(2) Physicists	2722					%
(3) Other physical scientists	2723					%
c. Environmental scientists (total)	2730					%
(1) Earth scientists	2731					%
(2) Atmospheric scientists	2732					%
(3) Oceanographers	2733					%
d. Mathematical & computer scientists (total)	2740					%
(1) Mathematicians (exclude computer scientists)	2741					%
(2) Computer scientists (exclude programmers).	2742					%
e. Life scientists (total).	2750					%
(1) Agricultural scientists	2751					%
(2) Biological scientists	2752					%
(3) Medical scientists (see instructions, p. 1)	2753					%
f. Psychologists (total)	2760					%
g. Social scientists (total) (exclude historians)	2770					%
(1) Economists	2771					%
(2) Sociologists	2772					%
(3) Political scientists	2773					%
(4) Other social scientists	2774					%
h. Total (sum of a thru g).	2700					%

NOTE: If you presented data in column 5 in terms of absolute numbers instead of percentages, please check this box ☐

^a/Totals in column 2 should be the same as corresponding totals in column 1 of item 1.

^b/Totals in column 3 should be the same as corresponding totals in column 1 of item 1.

SECTION B. NUMBER OF TECHNICIANS EMPLOYED IN THE SCIENCES AND ENGINEERING, January 1978

Item
7.

Technicians, by field and function in which primarily employed, January 1978

FIELD OF EMPLOYMENT		TOTAL (1)	R&D (2)	Other activities (3)
a. Engineering technicians	2810			
b. Physical science technicians	2820			
c. Environmental science technicians	2830			
d. Mathematical and computer science technicians	2840			
e. Life science technicians	2850			
f. Psychology technicians	2860			
g. Social science technicians	2870			
h. Total (sum of a thru g)	2800			

CHECK LIST

- () 1. Are all entries rounded to whole numbers? (Please do not enter fractions or decimals, except in column 5 of item 6 where one decimal place is optional.)
- () 2. Do the data add to subtotals?
- () 3. Are all items completed? YOUR ESTIMATES will be better than OURS. An explanation of estimates may be noted on a separate sheet or in the remarks.
- () 4. Are all branches and components such as a medical school and agricultural experiment station included?
- () 5. Have you included all postdoctorals?

1977-78 DATA CHECK

Please compare your January 1978 personnel data with your survey response for January 1977, particularly for the following item totals. Please explain below or on a separate sheet any significant changes and where possible, indicate any required adjustments in data reported in previous surveys.

1977

1978

Line 2100, col. 1

Line 2100, col. 1

Total full-time scientists & engineers

Line 2300, col. 1

Line 2300, col. 1

Total part-time scientists & engineers

Line 2800, col. 1

Line 2800, col. 1

Total technicians employed in the sciences and engineering

CONFIDENTIALITY

The National Science Foundation recognizes that its ability to gather much of the enclosed information would be severely impaired if it could not be held in confidence. Please indicate below the number of any items which would not be supplied but for assurance that the source will be held in confidence. The Foundation will hold in confidence such information to the extent permitted by law.

ITEM:

REMARKS

PLEASE TYPE OR PRINT
NAME OF PERSON SUBMITTING THIS FORM

TITLE

AREA
CODE

EXCH

NO.

EXT

NAME OF PERSON WHO PREPARED THIS
SUBMISSION (If different from above)

TITLE

AREA
CODE

EXCH

NO.

EXT

NAME OF INSTITUTION

DATE

ADDRESS (number, street, city, State, ZIP code)

Survey of Graduate Science Student Support and Postdoctorals (GSSSP)

Purpose

The survey is designed to obtain data on the characteristics of graduate science and engineering (S/E) enrollment at the department level including: Enrollment status (full or part time); level of study (first year or beyond); types and sources of major support of full-time students; numbers of women studying full time and the primary sources of their support and level of study; numbers of women studying part time; the total number of foreign full-time graduate students; and the support of postdoctoral appointees. Thus, the GSSSP compiles a factual base for assessing the relationship between financial support patterns and resulting shifts in graduate enrollment. It provides the only nationally representative data bank on sources of support of graduate S/E students and their enrollment characteristics. Data for the doctorate- and master's-granting institutions are collected on NSF Forms 812 and 812A, respectively.

Survey Instrument

Between 1967 and 1971 data on the support of graduate students and postdoctorals were collected through applications for NSF traineeships. The 1972 survey was designed to continue the collection of similar data from an expanded universe of graduate departments in all S/E doctorate-granting institutions. Each year thereafter the survey universe expanded: First, through the inclusion of all medical schools with graduate programs; second, with the addition of new doctorate-granting institutions and departments within the scope of the survey; and third, with the inclusion of all S/E master's-granting institutions in 1976 and 1977. A copy of the 1977 full-scale survey instrument follows.

Beginning in fall 1978, a short version of the regular full-scale survey questionnaire was designed for doctorate-granting institutions only, in response to Federal efforts to reduce the survey respondents' reporting burden while maintaining the essential items necessary to preserve the time series. The full-scale survey will be conducted on a biennial basis, beginning in fall 1979.

References

The following NSF publications issued since 1970 contain findings of GSSSP surveys:

Graduate Student Support and Manpower Resources in Graduate Science Education

Fall 1969: (NSF 70-40)

Fall 1970: (NSF 71-27)

Graduate Science Education: Student Support and Postdoctorals

Fall 1972: (NSF 73-315). Available from NSF, GPO, and NTIS (PB 234 721)

Fall 1973: (NSF 74-318). Available from NSF, GPO, and NTIS (PB 249 152)

Fall 1974: (NSF 76-313). Available from NSF, GPO, and NTIS (PB 272 872)

Fall 1975: (NSF 77-313). Available from NSF, GPO, and NTIS (PB 272 879)

Fall 1976: *Tables* (NSF 77-319). Available from NSF and NTIS (PB 279 202)

Science Resources Studies Highlights (NSF 77-302). Available from NSF

Fall 1977: *Tables* (NSF 78-315). Available from NSF and NTIS (PB 289 718)

Science Resources Studies Highlights (NSF 78-307). Available from NSF

Data Access

For doctorate-granting institutions, data tapes are currently available for fall 1967, 1968, 1970, 1971, 1972, 1973, 1974, 1975, 1976, and 1977. For master's-granting institutions, data tapes are currently available for fall 1975, fall 1976, and fall 1977. The fall 1975 data tape for master's-granting institutions provides only selected data variables for each department; these were collected on the fall 1976 questionnaires and correspond to columns E, H, and K on the fall 1976 questionnaire. The departmental populations for the available years are as follows:

Doctorate-Granting Institutions:

From Applications for NSF Traineeships:

Fall 1967—3014 Departments

Fall 1968—3190 Departments

Fall 1970—3544 Departments

Fall 1971—3397 Departments

From GSSSP Surveys:

Fall 1971—4593 Departments (from fall 1972
Survey)
Fall 1972—4593 Departments
Fall 1973—6571 Departments
Fall 1974—7495 Departments
Fall 1975—7656 Departments
Fall 1976—7771 Departments
Fall 1977—7951 Departments

Master's-Granting Institutions:

Fall 1975—1477 Departments
Fall 1976—1504 Departments
Fall 1977—1562 Departments

For further information regarding data tape availability or contents, please contact:

Moshman Associates, Inc.
University Statistics Group
6400 Goldsboro Road
Washington, D.C. 20034
301/229-3000

The cost of the tapes is \$80 per tape for the first five tapes (one survey year on each tape) and \$50 for each additional tape. A *Data User Guide* has been developed for 1971-77 tape users that documents the compatible code structure utilized in NSF's Integrated Data Base—a 4-survey system of academic institutions' R&D personnel and financial resources devoted to S/E activities, of which this survey is a part.

DEPARTMENTAL DATA SHEET

(NOTE: BEFORE FILLING OUT PLEASE READ THE ATTACHED INSTRUCTIONS)

1. Name and address of institution: _____
2. Science or engineering department (or unit) covered by this data sheet: _____
3. Person in department (or unit) preparing this form:
Name: _____ Tel: () _____
Title: _____
4. Highest degree program offered by department (or unit) in fall 1977? (CHECK ONE ONLY) Master's ____ (1) Doctorate ____ (2)

Institution and
department code
(Leave blank)

(NOTE: IF YOUR DEPARTMENT DOES NOT ENROLL GRADUATE STUDENTS, PLEASE MOVE TO ITEM 7 BELOW)

5. FULL-TIME GRADUATE STUDENTS enrolled for advanced degrees (master's and doctorate) in fall 1977 (See Item 5 - Instructions)			STUDENTS RECEIVING FINANCIAL ASSISTANCE								SELF-SUPPORTED STUDENTS (Including loans and family sources) (I)	TOTAL FOR ALL SOURCES [Sum of (A) thru (I)] (J)
MECHANISMS OF SUPPORT	LEVEL OF STUDY		Department of Defense (A)	DHEW		National Science Foundation (D)	Other Federal sources (E)	NON-FEDERAL SOURCES				
				National Institutes of Health (B)	Other DHEW (C)			Institutional support ^{1/} (F)	Foreign sources (G)	Other U.S. sources ^{2/} (H)		
Graduate fellowships and traineeships	First year	(1)										
	Beyond first	(2)										
Graduate research assistantships	First year	(3)										
	Beyond first	(4)										
Graduate teaching assistantships	First year	(5)										
	Beyond first	(6)										
Other types of support	First year	(7)										
	Beyond first	(8)										
TOTAL		(9)										
For each total on line (9) how many are WOMEN?	First year	(10)										
	Beyond first	(11)										

FOREIGN STUDENTS

(12)

Of the full-time graduate students shown in line (9), column (J), how many are FOREIGN students?

6. PART-TIME GRADUATE STUDENTS FALL 1977

First year	Beyond first	TOTAL
(A)	(B)	(C)
Of the total in column C above, how many are WOMEN?		(D)

CHECK LIST

- ☐ Are all items completed?
- ☐ Do the data add to totals in line 9 and in column J?
- ☐ All self-supported students should be INCLUDED in column I.
- ☐ Be sure to EXCLUDE M.D., D.V.M., and D.D.S. candidates from items 5 and 6.

7. POSTDOCTORALS AND/OR RESEARCH ASSOCIATES FALL 1977

SOURCE OF SUPPORT			TOTAL (Sum of (A) thru (C)) (D)	Of the TOTAL in column D, how many are FOREIGN? (E)
Federal		Non-Federal		
Fellowships/traineeships	Research associates			
(A)	(B)	(C)	(D)	(E)

1/ Include support from this university and State and local governments.

2/ Include support from nonprofit institutions, industry, and all other U.S. sources.

only. Your response is entirely voluntary and your failure to provide some or all of the information will in no way adversely affect your institution.

NOTE: This information is solicited under the authority of the National Science Foundation Act of 1950, as amended. All information you provide will be used for statistical purposes.

INSTRUCTIONS FOR COMPLETING THE DEPARTMENTAL DATA SHEET, FALL 1976

General

Information supplied by your department on a Departmental Data Sheet (NSF Form 812) should reflect enrollment and postdoctoral appointments in fall 1977. A Form 812 is to be completed by each science and engineering department that supplied similar data in our 1976 survey or by any newly formed departments or any departments that were inadvertently omitted last year. A list of departments for which data were submitted in 1976 has been provided to your Survey Coordinator on NSF Form 811.

A graduate student is defined as a student enrolled for credit in an advanced-degree program leading to a master's or Ph.D. degree, M.D., D.V.M. or D.D.S. candidates, interns, and residents should NOT be reported UNLESS they are concurrently working for a master's or Ph.D. Individuals who already hold an M.D., D.V.M. or D.D.S., master's, or Ph.D. degree but who are working on ANOTHER master's or Ph.D. degree are to be counted as graduate students, either full or part time. DO NOT report such individuals as postdoctorals in item 7.

Graduate students performing thesis or dissertation research away from the campus at Government and contractor-owned facilities in the United States are to be included as long as they are enrolled for credit in an advanced-degree program. Students enrolled at a branch or extension center in a foreign country are to be EXCLUDED.

A graduate student, whether full- or part-time, should be reported in only one department. If any students or postdoctorals are in interdisciplinary programs, please coordinate your response with the other participating departments, so that each student or postdoctoral will be counted only once.

Care should be taken to submit as complete and accurate a report as possible so that followup procedures with your institution may be reduced to a minimum, and more timely statistics can be made available. If there are any questions concerning your response, please contact:

Tele Sec Data Preparation Division
1725 K Street, N.W., Suite 16
Washington, D.C. 20006

Or call (collect): (202)-223-2651

Item Instructions

HIGHEST DEGREE PROGRAM OFFERED, item 4: Check the box which refers to the HIGHEST DEGREE program offered by this science department in fall 1977.

FULL-TIME GRADUATE STUDENTS, item 5: A full-time graduate student is defined as a student enrolled for credit in a master's or Ph.D. degree program (not a regular staff

member) who is engaged full time in training activities in his field of science; these activities may embrace any appropriate combination of study, teaching, and research, depending upon YOUR INSTITUTION'S OWN POLICY. If your department has no full-time graduate students, write "NONE" in item 5 and move to item 6.

MECHANISMS OF SUPPORT, item 5, lines 1-8: Report each full-time graduate student according to the TYPE OF MAJOR SUPPORT received in the fall of 1977. Students should be reported as receiving a fellowship or traineeship in lines 1 and 2, if this mechanism constitutes the major source of his support. A student receiving primary support from an assistantship should be classified as a research assistant in lines 3 and 4, or as a teaching assistant in lines 5 and 6, according to how each spends the majority of his time, e.g., a graduate assistant devoting most of his time to teaching should be classified as a graduate teaching assistant. All other full-time students should be reported in lines 7 and 8.

LEVEL OF STUDY, FIRST-YEAR AND BEYOND-FIRST, items 5 & 6: A FIRST-YEAR graduate student is defined as one who will have completed LESS THAN A FULL YEAR of graduate study as of the beginning of the fall term in 1977. All other graduate students should be considered BEYOND THEIR FIRST YEAR.

STUDENTS RECEIVING FINANCIAL ASSISTANCE, item 5, columns (A) thru (H): Report the number of full-time graduate students in the appropriate column according to the source of the largest portion of their support. In determining the source of major support, consider only tuition and other academic expenses. If a graduate student receives stipend support from more than one source, choose the MAJOR category of support.

FEDERAL SOURCES, Columns (A) thru (E): Report the number of full-time graduate students in the appropriate column where they receive the largest portion of their support. Full-time graduate students receiving the largest portion of their support from Federal Government LOANS should be reported as SELF-SUPPORTED, column I.

Department of Defense (DOD), column (A): Report full-time graduate students receiving support from the Department of the Army, Navy, or Air Force. Students receiving their MAJOR support from the Veterans Administration under the G.I. Bill should be reported under column (E), "Other Federal sources," if this form of support does not constitute his MAJOR source, the student should be counted in the appropriate column representing that source.

Department of Health, Education, and Welfare (DHEW), columns (B) and (C): Report full-time graduate students receiving support from the institutes or divisions of the NATIONAL INSTITUTES OF HEALTH (NIH), under column (B); support from all other components of DHEW should be reported under column (C), as indicated below:

Column (B)

Division of Research Resources
Fogarty International Center
National Cancer Institute
National Eye Institute
National Heart, Lung, and Blood Institute
National Institute on Aging
National Institute of Allergy and
Infectious Diseases
National Institute of Arthritis, Metabolism,
and Digestive Diseases
National Institute of Child Health and
Human Development
National Institute of Dental Research
National Institute of Environmental
Health Sciences
National Institute of General Medical Sciences
National Institute of Neurological and
Communicative Disorders and Stroke

Column (C)

Alcohol, Drug Abuse, and Mental
Health Administration (including National
Institute of Mental Health)
Center for Disease Control
Food and Drug Administration
Health Resources Administration
Health Services Administration
National Institute of Education
Office of Education
Social and Rehabilitation Service

NONFEDERAL SOURCES, columns (F) thru (H):

Institutional support, column (F): Report full-time graduate students receiving support from your own institution and State and local governments. Funds given to a university by the FEDERAL GOVERNMENT, such as training grant funds, should be reported under the appropriate Federal agency and NOT reported as institutional support.

Foreign sources, column (G): Include support from any non-U.S. source.

Other U.S. sources, column (H): Include support from nonprofit institutions, private industry, and all other U.S. sources.

SELF-SUPPORTED STUDENTS, column (I): Include full-time graduate students whose major source of support is derived from loans from any source and from personal or family financial contributions. Full-time graduate students receiving the largest portion of their support from Federal loans should be reported here.

WOMEN, lines 10 and 11: Report the sources of support of all first-year women students in line 10 and those beyond their first year in line 11. Please note that in each column, line 10 should not exceed the total of all first-year students and line 11 should not exceed the total of those beyond their first year.

FOREIGN STUDENTS, line 12: A FOREIGN full-time graduate student is defined as one who has not attained U.S. citizenship. Do not include native residents of a U.S. possession, such as American Samoa. Applicants for U.S. citizenship are to be considered as "FOREIGN" until the date their citizenship becomes effective.

PART-TIME GRADUATE STUDENTS, item 6: A part-time graduate student is defined as a student who is enrolled in a master's or Ph.D. program, who is NOT pursuing graduate work full time as defined above in item 5. Please report the total number of women enrolled part time in column D. If your department has no part-time graduate students, write "NONE" in item 6 and move to item 7.

POSTDOCTORALS AND/OR RESEARCH ASSOCIATES, item 7: Under this category, include individuals with science or engineering doctorates or M.D.'s (including foreign degrees that are equivalent to U.S. doctorates) who devote FULL TIME to RESEARCH activities or study in the department under temporary appointments carrying no academic rank. Such appointments are usually for a SPECIFIC TIME PERIOD. They may contribute to the academic program through seminars, lectures, or working with graduate students. Their postdoctoral activities have an element of additional training for them. Exclude medical residents, unless RESEARCH TRAINING under the supervision of a Senior Mentor is the PRIME PURPOSE of the appointment. Under column (A) enter the number of fellows and trainees receiving support under Federal training grants and/or fellowships. Under column (B) enter the number of research associates appointed with Federal support. Those remaining appointees with non-Government support are to be entered under column (C). Of the total in column (D), enter in column (E) the number of postdoctorals with FOREIGN citizenship.

Fields of Science

This form is being mailed to all institutions of higher education in the United States that confer doctorate-level degrees in the sciences and/or engineering, and to all medical schools contributing to the training of science master's and Ph.D. candidates and postdoctorals. Please return the completed forms for each graduate department in your institution represented by the following fields:

Engineering

Aeronautical
Agricultural
Architectural
Biomedical
Chemical
Civil
Electrical
Engineering sciences
Industrial
Mechanical
Metallurgical
Mining
Nuclear
Petroleum
Other engineering

Physical Sciences

Astronomy
Chemistry
Physics
Other physical sciences

Environmental Sciences

Atmospheric sciences
Geosciences
Oceanography
Other environmental sciences

Mathematical Sciences

Applied mathematics and computer sciences
Mathematics
Statistics

Life Sciences

Agriculture
Biological sciences
 Anatomy
 Biochemistry
 Biology
 Biometry and biostatistics
 Biophysics
 Botany
 Cell biology
 Ecology
 Entomology and parasitology
 Genetics
 Microbiology
 Nutrition
 Pathology
 Pharmacology
 Physiology
 Zoology
 Other biosciences
Other life sciences
 Anesthesiology
 Cardiology
 Clinical medicine
 Clinical pharmacology
 Dental sciences
 Endocrinology
 Gastroenterology
 Hematology
 Neurology
 Nursing

Obstetrics and gynecology
Ophthalmology
Otorhinolaryngology
Pediatrics
Pharmaceutical sciences
Preventive medicine, community and public health
Psychiatry
Pulmonary disease
Radiology
Speech pathology and audiology
Surgery
Veterinary sciences
Other health related sciences

Psychology

Clinical psychology
Experimental psychology
Human development
Physiological psychology
Social psychology
Other psychology

Social Sciences

Agricultural economics
Anthropology
Economics (except agric.)
Geography
History and philosophy of science
Linguistics
Political science
Public administration
Social work
Sociology
Urban planning
Other social sciences

PLEASE EXCLUDE FROM YOUR RESPONSE ALL GRADUATE DEPARTMENTS IN THE FIELDS OF EDUCATION, LAW, HUMANITIES, MUSIC, THE ARTS, PHYSICAL EDUCATION, LIBRARY SCIENCE, AND ALL OTHER NONSCIENCE FIELDS.

Form 812 is to be returned to each institution's Survey Coordinator for transmittal by January 31, 1978 to:

Tele Sec Data Preparation Division
1725 K Street, N.W., Suite 16
Washington, D.C. 20006

Thank you very much for your cooperation.

**Office of Program Planning and Evaluation
National Institutes of Health
Bethesda, Maryland 20014**

**Division of Science Resources Studies
National Science Foundation
Washington, D.C. 20550**

NATIONAL SCIENCE FOUNDATION
SURVEY OF GRADUATE SCIENCE STUDENT SUPPORT AND POSTDOCTORALS, FALL 1977

INSTITUTIONAL DATA SHEET

(NOTE: BEFORE FILLING OUT PLEASE READ INSTRUCTIONS BELOW)

INSTITUTION:

PLEASE REVIEW THE LIST OF DEPARTMENTS PRINTED BELOW AND MAKE CORRECTIONS,
DELETIONS, AND ADDITIONS DIRECTLY ON THE FORM, AS NECESSARY.

DEPT. CODE (LEAVE BLANK)	MASTER'S-LEVEL SCIENCE AND ENGINEERING DEPARTMENTS	FULL-TIME STUDENTS ENROLLED FOR MASTER'S DEGREES							PART-TIME STUDENTS ENROLLED FOR MASTER'S DEGREES			
		SOURCES OF MAJOR SUPPORT				TOTAL (SUM OF (A) THRU (D))	OF THE TOTAL IN (E), HOW MANY ARE:		FOREIGN STU- DENTS	TOTAL	OF THE TOTAL IN (I), HOW MANY ARE:	
		FEDERAL GOVERN- MENT SUPPORT	INSTI- TU- TIONAL SUPPORT **	OTHER OUTSIDE SUPPORT ***	SELF- SUPPORT ****		NEW	WOMEN			NEW	WOMEN
		(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)
	PLEASE ADD ANY NEW OR INTER- DEPARTMENTAL PROGRAMS IN SCIENCE AND ENGINEERING NOT LISTED ABOVE											

* NOTE: THE FIRST DIGIT OF THE DEPARTMENT CODE IS DEFINED AS FOLLOWS:

1 - ENGINEERING; 2 - PHYSICAL SCIENCES; 3 - ENVIRONMENTAL SCIENCES; 4 - MATHEMATICAL SCIENCES;
5 - AGRICULTURE; 6 - BIOLOGICAL SCIENCES; 7 - HEALTH SCIENCES; 8 - PSYCHOLOGY; 9 - SOCIAL SCIENCES

** INCLUDE SUPPORT FROM THIS INSTITUTION AND STATE AND LOCAL GOVERNMENTS.

*** INCLUDE SUPPORT FROM NONPROFIT INSTITUTIONS, INDUSTRY, AND ALL OTHER OUTSIDE SOURCES.

**** INCLUDE LOANS AND FAMILY ASSISTANCE.

FOR YOUR CONVENIENCE WE HAVE LISTED ENROLLMENT
DATA YOU REPORTED IN FALL 1976

DEPT. CODE	MASTER'S-LEVEL SCIENCE AND ENGINEERING DEPARTMENTS	TOTAL FULL-TIME STUDENTS ENROLLED FOR MASTER'S DEGREES	TOTAL PART-TIME STUDENTS ENROLLED FOR MASTER'S DEGREES
		(E)	(E)

NOTE: E INDICATES ESTIMATE
I INDICATES IMPUTATION
N INDICATES NOT AVAILABLE

Note: This information is solicited under the authority of the National Science Foundation Act of 1950, as amended. All information you provide will be used for statistical purposes only. Your response is entirely voluntary and your failure to provide some or all of the information will in no way adversely affect your institution.

* PLEASE RETURN ONE COPY OF THIS FORM BY 1/31/78 TO: *
* TELE SEC DATA PREPARATION DIVISION *
* 1725 K STREET, N.W., SUITE 16 *
* WASHINGTON, D.C. 20006 *

BEST DOCUMENT AVAILABLE

GENERAL

Information supplied for each master's-level department on the Institutional Data Sheet (NSF Form 812A) should reflect total enrollment in fall 1977. A list of departments, for which data were submitted in 1976, appears on the form. Corrections to department names should be made directly on the form. Space is also provided to add any new or interdepartmental programs, as well as any master's-level science and engineering departments which were inadvertently omitted last year.

A GRADUATE STUDENT is defined as a student enrolled for credit in an advanced-degree program leading to a master's degree in science or engineering. Individuals who already hold a master's, M.D., D.D.S., D.V.M., or Ph.D. degree but who are working on ANOTHER master's degree are to be counted as graduate students, either full- or part-time.

Graduate students performing thesis or dissertation research away from the campus at Government and contractor-owned facilities in the United States are to be included as long as they are enrolled for credit in a master's degree program. Students enrolled at a branch or extension center in a foreign country are to be EXCLUDED.

A graduate student, whether full- or part-time, should be reported in only one department. If any students are in interdisciplinary programs, please be sure that each student will be counted only once. If a graduate student is enrolled in an inter-institutional program, please report the student only if the degree will be granted by your institution.

Care should be taken to submit as complete and accurate a report as possible so that followup procedures with your institution may be reduced to a minimum, and more timely statistics can be made available. If there are any questions concerning your response, please contact:

Dan Graser
Tele Sec Data Preparation Division
1725 K Street, N.W., Suite 16
Washington, D. C. 20006

Or call (collect): (202) 223-2651

ITEM INSTRUCTIONS

FULL-TIME GRADUATE STUDENTS, columns (A)-(H): A full-time graduate student is defined as a student enrolled for credit in a master's degree program (not a regular staff member) who is engaged full time in training activities in his field of science; these activities may embrace any appropriate combination of study, teaching, and research, depending upon YOUR INSTITUTION'S OWN POLICY. If a department has no full-time graduate students, write 'NONE' in column (C).

SOURCES OF MAJOR SUPPORT, columns (A)-(D): Report the number of full-time graduate students in the appropriate column according to the source of the largest portion of

their support. In determining the source of major support, consider only tuition and other academic expenses. If a graduate student receives stipend support from more than one source, choose the MAJOR category of support.

FEDERAL GOVERNMENT SUPPORT, column (A): Report full-time graduate students receiving the largest portion of their support from Federal agencies. Full-time graduate students receiving their MAJOR support from the Veterans Administration under the G.I. Bill should be reported here. Full-time graduate students whose major source of support is from Federal Government LOANS should be reported under SELF-SUPPORT, column (D).

INSTITUTIONAL SUPPORT, column (B): Report full-time graduate students receiving support from your own institution and State and local governments. Funds given to a university by the FEDERAL GOVERNMENT, such as training grant funds, should be reported under FEDERAL GOVERNMENT SUPPORT, column (A) and NOT reported as INSTITUTIONAL SUPPORT.

OTHER OUTSIDE SUPPORT, column (C): Report full-time graduate students receiving support from nonprofit institutions, private industry, and all other U.S. sources, as well as any non-U.S. sources.

SELF-SUPPORT, column (D): Include full-time graduate students whose major source of support is derived from loans from any source and from personal or family financial contributions. Full-time graduate students receiving the largest portion of their support from Federal loans should be reported here. PLEASE BE SURE THAT ALL SELF-SUPPORTED STUDENTS ARE INCLUDED.

MEN/WOMEN, columns (F) and (G), (J) and (K): Of the total column (E), report the number of male full-time graduate students in column (F) and female full-time graduate students in column (G). Similarly, of the total in column (I), report the number of male part-time graduate students in column (J) and female part-time graduate students in column (K).

FULL-TIME FOREIGN STUDENTS, column (H): Of the total in column (E), report the number of FOREIGN graduate students, those who have not attained U.S. citizenship. Do not include native residents of a U.S. possession, such as American Samoa. Applicants for U.S. citizenship are to be considered as "FOREIGN" until the date their citizenship becomes effective.

PART-TIME GRADUATE STUDENTS, columns (I)-(K): A part-time graduate student is defined as a student who is enrolled in a master's program who is NOT pursuing graduate work full time as defined above. If a department has no part-time graduate students, write 'NONE' in column (H).

FIELDS OF SCIENCE

This form is being mailed to all institutions of higher education in the United States that confer the master's as the highest degree granted in the sciences and/or engineering. Please be sure that the completed form includes all master's-level departments in your institution represented by the following fields:

ENGINEERING

Aeronautical
Agricultural
Architectural
Biomedical
Chemical
Civil
Electrical
Engineering sciences
Industrial
Mechanical
Metallurgical and materials
Mining
Nuclear
Petroleum
Other engineering

PHYSICAL SCIENCES

Astronomy
Chemistry
Physics
Other physical sciences

ENVIRONMENTAL SCIENCES

Atmospheric sciences
Geosciences
Oceanography
Other environmental sciences

MATHEMATICAL SCIENCES

Applied mathematics and computer sciences
Mathematics
Statistics

LIFE SCIENCES

Agriculture
Biological sciences
Anatomy
Biochemistry
Biology
Biometry and biostatistics
Biophysics
Botany
Cell biology
Ecology
Entomology and parasitology
Genetics
Microbiology
Nutrition
Pathology
Pharmacology
Physiology
Zoology
Other biosciences

Health sciences

Anesthesiology
Cardiology
Clinical medicine
Clinical pharmacology
Dental sciences
Endocrinology
Gastroenterology
Hematology
Neurology
Nursing
Obstetrics and gynecology
Ophthalmology
Otorhinolaryngology
Pediatrics
Pharmaceutical sciences
Preventive medicine, community, and public health
Psychiatry
Pulmonary disease
Radiology
Speech pathology and audiology
Surgery
Veterinary sciences
Other health related sciences

PSYCHOLOGY

Clinical psychology
Experimental psychology
Human development
Physiological psychology
Social psychology
Other psychology

SOCIAL SCIENCES

Agricultural economics
Anthropology
Economics (except agricultural)
Geography
History and philosophy of science
Linguistics
Political science
Public administration
Social work
Sociology
Urban planning
Other social sciences

PLEASE EXCLUDE FROM YOUR RESPONSE ALL MASTER'S DEPARTMENTS IN THE FIELDS OF EDUCATION, LAW, HUMANITIES, MUSIC, THE ARTS, PHYSICAL EDUCATION, LIBRARY SCIENCE, AND ALL OTHER NONSCIENCE FIELDS.

Thank you very much for your cooperation.

Division of Science Resources Studies
National Science Foundation
Washington, D.C. 20550

Primarily Funding Resources

Survey of Industrial Research and Development

Purpose

The National Science Foundation has sponsored the Survey of Industrial Research and Development since 1953 to obtain data on the magnitude and underlying trends in the R&D efforts of American firms. The Bureau of the Census (Census) conducts this annual survey and prepares the statistical tables for the Foundation. The survey is designed to collect data on dollar volume of research and development, sources of financing, employment of R&D scientists and engineers, and other economic characteristics of industrial R&D performance.

Survey Instrument

A copy of the 1977 survey form follows.

Sample

The sample used for the Survey of Industrial Research and Development represents all manufacturing industries and those nonmanufacturing industries known—on the basis of earlier, more detailed samples—to conduct or to finance research and development. The sampling unit for the survey is the company, defined as a business organization consisting of one or more establishments under common ownership or control. Approximately once every five years a new panel for the R&D survey is selected.

The 1977 industry survey is the 21st in the annual series sponsored by the Foundation and conducted by Census. The Foundation also sponsored two industry surveys covering the 1953–56 period, which were conducted by the Bureau of Labor Statistics (BLS). Data obtained in the BLS survey are not directly comparable with the Census figures for 1957–

76 because of methodological and other differences in the surveys conducted by the two agencies.

References

Data from the survey as published since 1970 by NSF can be found in:

Research and Development in Industry

- 1968: (NSF 70-29)
- 1969: (NSF 71-18)
- 1970: (NSF 72-309). Available from NTIS (PB 223 172)
- 1971: (NSF 73-305). Available from NTIS (N 74 10894)
- 1972: (NSF 74-312)
- 1973: (NSF 75-315). Available from NSF, GPO, and NTIS (PB 248 529)
- 1974: (NSF 76-322). Available from NSF and NTIS (PB 263 779)
- 1975: (NSF 77-324). Available from NSF, GPO, and NTIS (PB 285 569)
- 1976: *Tables* (NSF 78-314). Available from NSF and NTIS (PB 289 719)

Data Access

Data on individual companies cannot be released by Census because of proprietary considerations. However, additional tabulations of data collected on the enclosed survey form are available directly from the Census Bureau. The cost is dependent on the amount of detail involved. Information on the availability of data and costs may be obtained from:

Mr. Wayne McCaughey
Industry Division
Bureau of the Census
U.S. Department of Commerce
Washington, D.C. 20233
(301) 763-5616

FORM RD-1
(11-1-77)

U.S. DEPARTMENT OF COMMERCE
BUREAU OF THE CENSUS
COLLECTING AND COMPILING AGENT FOR
THE NATIONAL SCIENCE FOUNDATION

**SURVEY OF INDUSTRIAL RESEARCH
AND DEVELOPMENT DURING 1977**

RETURN TO Bureau of the Census
1201 East Tenth Street
Jeffersonville, Indiana 47132

Name of person who supplied 1976 data

NOTE: Data supplied in items 2A and 2B and in item 5C, columns 2 and 4, for 1977 on this form, will satisfy the mandatory reporting requirement of Census Form MA-121 (title 13, U.S. Code). Although you are not required to complete the other items, your cooperation on these voluntary items is needed to make the results of this survey comprehensive, accurate, and timely.

NOTICE - Your report to the Census Bureau is confidential by law (title 13, U.S. Code). It may be seen only by sworn Census employees and may be used only for statistical purposes. The law also provides that copies retained in your files are immune from legal process.

Item 1 - NAME AND ADDRESS OF COMPANY - Please correct any error in name and address including ZIP code

Group	Survey
4	4001

PLEASE RETURN THIS COPY

CENSUS USE ONLY	1	2	3	4	5	6

GENERAL INSTRUCTIONS

- Please complete and return this form in the envelope provided within 60 days. Retain the file copy for your records. This report should cover your entire company, including all subsidiaries and affiliates, unless otherwise designated.
- Enter "None" where appropriate rather than leaving a blank space.
- Reasonably accurate estimates are acceptable.
- Be sure 1976 and 1977 figures are comparable.

PLEASE READ ENCLOSED INSTRUCTIONS BEFORE COMPLETING THIS FORM

GENERAL CONSTANT DATA

Item 2 - DOMESTIC SALES, RECEIPTS, AND EMPLOYMENT FOR COMPANY

CT1	1976	1977
A. Domestic net sales and receipts of this company (Thousands of dollars)	2001	
B. Total domestic company employment in all activities during the pay period which includes the 12th of March 1976 and 1977	2002	

Item 3 - RESEARCH AND DEVELOPMENT EXPENDITURES

Are research and development expenditures for entire domestic company, including subsidiaries and affiliates, reported on this form? ☐ Yes ☐ No - Please explain in remarks or on transmittal letter

Item 4 - NUMBER OF RESEARCH AND DEVELOPMENT SCIENTISTS AND ENGINEERS
(See instruction Manual, page 3)

CT2	1976	January 1977
A. Federal research and development	3001	
B. Company and other research and development	3002	
C. TOTAL (Sum of A and B)	3009	

Item 5 - COST OR RECEIPTS FOR RESEARCH AND DEVELOPMENT PERFORMED WITHIN THE COMPANY BY MAJOR TYPE AND SOURCE OF FUNDS

CT2	Thousands of dollars			
	1976	Federal funds	Company and other funds, except Federal	TOTAL (Sum of columns 2 and 3)
A. Basic research If "None," please mark ☐ 35105	3510			
B. Applied research and development				
1. Applied research	3521			
2. Development	3522			
3. Total (Sum of lines 1 and 2)	3529			
C. TOTALS (Sum of A and B)	3509			
D. 1976 TOTALS				
E. Company and other funds, except Federal, budgeted for the year 1978	CT1	3599		

Item 6 - COST OF RESEARCH AND DEVELOPMENT BY PRINCIPAL FEDERAL AGENCY

CT1	1977
1. Department of Defense	3701
2. National Aeronautics and Space Administration	3702
3. All other Federal Agencies	3703
4. TOTAL COST (Sum of 1, 2, and 3)	3709

Please continue on page 2

Section II - R&D PERFORMED WITHIN THE COMPANY IN THE UNITED STATES - Continued
 Exclude R&D financed by the company but performed by others. Report such R&D in section III.

Item 7 - COST OR CONTRACT VALUE OF RESEARCH AND DEVELOPMENT PERFORMED WITHIN THIS COMPANY BY MAJOR TYPE OF EXPENSE	CT1	Thousands of dollars			
		1976	1977		
		1	2		
A. Wages and salaries of research and development personnel (include scientists and engineers, technicians, secretaries, and other personnel)	4010	\$	\$		
B. Costs of materials and supplies consumed (do not include in this item components, models, and other materials supplied by other research organizations)	4020				
C. Other costs (include service and supporting costs, depreciation, and share of overhead)	4030				
D. TOTAL COSTS (Sum of A through C) (Same as item 5C, columns 1 and 4) →	4099	\$	\$		
Item 8 - FIELDS OF BASIC RESEARCH (Of the total reported in item 5A for basic research, please give cost for the following fields.)		1	2		
A. Chemistry	5001	\$	\$		
B. Engineering (including metallurgy)	5002				
C. Geological sciences	5003				
D. Mathematics	5004				
E. Physics	5005				
F. Astronomy	5006				
G. Atmospheric sciences	5007				
H. Oceanography	5008				
I. Biological sciences	5009				
J. Clinical medical sciences	5010				
K. Other sciences	5011	\$	\$		
L. TOTAL BASIC RESEARCH COST (Same as item 5A, columns 1 and 4) →	5099	\$	\$		
Item 9 - APPLIED RESEARCH AND DEVELOPMENT BY PRODUCT GROUP (Of the total reported in item 5B, line 3, for applied research and development, please give cost of project for each of the following. See the instructions on how to classify and define research and development, page 6.)	CT2	Thousands of dollars			
		1976		1977	
		1	2	3	4
		Federal	Total	Federal	Total
1. Atomic energy devices (See Instruction Manual, page 6)					
2. Food and kindred products	6200	\$	\$	\$	\$
3. Textile mill products	6220				
4. Industrial inorganic and organic chemicals	6261				
5. Plastics materials and synthetic resins, rubber, and fiber	6282				
6. Drugs	6283				
7. Agricultural chemicals	6287				
8. All other chemicals	6289				
9. Petroleum refining and extraction	6290				
10. Rubber and miscellaneous plastics products	6300				
11. Stone, clay, glass, and concrete products	6320				
12. Primary ferrous products	6331				
13. Primary and secondary nonferrous metals	6339				
14. Fabricated metal products	6340				
15. Engines and turbines	6351				
16. Farm machinery and equipment	6352				
17. Construction, mining, and materials handling machinery	6353				
18. Metalworking machinery and equipment	6354				

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19. Office, computing, and accounting machines	6357				
20. Other machinery, except electrical	6359				
21. Electric transmission and distribution equipment	6361				
22. Electrical industrial apparatus	6362				
23. Radio and television receiving sets, except communication types	6365				
24. Electronic components and accessories, communications equipment	6366				
25. Other electrical machinery equipment and supplies	6369				
26. Missiles	6197				
27. Space vehicles	6198				
28. Aircraft and parts	6372				
29. Motor vehicles and equipment	6371				
30. Other transportation equipment	6379				
31. Professional and scientific instruments	6380				
32. Ordnance, except missiles	6199				
33. Other - Specify <i>x</i>	6998				
34. TOTAL APPLIED RESEARCH AND DEVELOPMENT COSTS (Same as Item 5B, line 3, columns 1, 2, and 4)	6999	\$	\$	\$	\$

Item 10 - COST OF RESEARCH AND DEVELOPMENT PERFORMED WITHIN THE COMPANY, BY STATE

Were all of the research and development costs reported in Item 5C, column 4, on this form for 1977 performed in the State listed in the address block (Item 1) of this form? ☐ Yes ☐ No

If "No," list the home State and any other States in which the various research and development laboratories or facilities are located, and estimate the costs associated with each State. If necessary, you may report up to 10 percent of your total as "Not distributed by State."

State (Attach an additional sheet if necessary)	CT1	Thousands of dollars			
		1976		1977	
		Private 1	Total 2	Federal 3	Total 4
A.	71	\$	\$	\$	\$
B.	71				
C.	71				
D.	71				
E.	71				
F.	71				
G.	71				
H.	71				
I.	71				
J.	71				
K.	71				
L.	71				
M.	71				
N.	71				
O.	71				
P. TOTAL COSTS (Same as Item 5C, on this form)	7199	\$	\$	\$	\$

FORM RD-1 (11-1-77)

Please continue on page 3

Item 11 - RESEARCH AND DEVELOPMENT BY FUNCTIONAL CATEGORY (Of the total reported in Item 5C, COSTS OR RECEIPTS FOR RESEARCH AND DEVELOPMENT, columns 3 and 4, report the following functional categories.)						
ENERGY RESEARCH AND DEVELOPMENT Include the project cost or portion of project cost incurred for the purpose of increasing energy resources or capabilities. Include cost by type of energy. If "None," please mark ☐ 80996		Thousands of dollars				
		1996		1977		1978
		Federal funds	Total funds	Federal funds	Total funds	Total projected costs
CT2		1	2	3	4	5
A. Total nuclear		8010	\$	\$	\$	\$
1. Fission		8011				
2. Fusion		8012				
B. Total fossil fuels		8020				
1. Oil		8021				
2. Gas		8022				
3. Shale		8023				
4. Coal		8024				
a. Synthetic fuels		8025				
b. Mining		8026				
c. All other		8027				
5. Other fossil fuels		8028				
C. Geothermal		8030				
D. Solar		8040				
E. Conservation and utilization		8050				
F. All other energy		8060				
G. Total of A through F		8099	\$	\$	\$	\$
POLLUTION ABATEMENT RESEARCH AND DEVELOPMENT Include the project cost or portion of the project cost incurred for the purpose of designing pollution abatement products or product characteristics or of designing pollution abatement features into processes. Include cost by form of pollution to be abated. If "None," please mark ☐ 81996		Thousands of dollars				
		1996		1977		1978
		Federal funds	Total funds	Federal funds	Total funds	Total projected costs
CT2		1	2	3	4	5
H. Air		8110	\$	\$	\$	\$
1. Automotive emission		8111				
2. Electric power plant emissions		8112				
3. All other		8113				
I. Water		8120				
J. Solid waste		8130				
K. Other		8140				
L. Total of H through K		8199	\$	\$	\$	\$
See Item 11 - RESEARCH AND DEVELOPMENT PERFORMED OUTSIDE THE DOMESTIC COMPANY						
Item 12 - TOTAL COMPANY FUNDS SPENT FOR RESEARCH AND DEVELOPMENT ACTIVITIES PERFORMED OUTSIDE THE COMPANY WITHIN THE UNITED STATES If "None," please mark ☐ 90013		Thousands of dollars				
		1996		1977		
		Federal funds	Total funds	Federal funds	Total funds	
CT1		1	2	3	4	
9001		\$	\$	\$	\$	
Item 13 - TOTAL COMPANY FUNDS SPENT FOR RESEARCH AND DEVELOPMENT ACTIVITIES PERFORMED BY FOREIGN AFFILIATES OUTSIDE THE UNITED STATES If "None," please mark ☐ 11603		Thousands of dollars				
		1996		1977		
		Federal funds	Total funds	Federal funds	Total funds	
CT2		1	2	3	4	
1160		\$	\$	\$	\$	
Remarks - Attach additional sheet if necessary						
Name of person to contact regarding this report		Address - Number and street, city, State, ZIP code		Telephone		
				Area code Number Extension		
Period covered by this report		From - Month/day/year		To - Month/day/year		
☐ Calendar year ☐ Fiscal year - Specify						
CERTIFICATION - This report is substantially accurate and has been prepared in accordance with instructions.						
Name of company		Address - Number and street, city, State, ZIP code				
Signature of authorized official		Title		Date		

Survey of Scientific and Engineering Expenditures at Universities and Colleges

Purpose

This biennial survey in its "long form" cycle collects information on three areas of academic spending for scientific activities: Separately budgeted R&D expenditures; expenditures for instruction and departmental research; and capital expenditures for scientific activities. Separately budgeted R&D expenditures are reported by source of funds, by type of activity, and by field of science.

Survey Instrument

NSF Form 411 is mailed biennially to over 500 institutions and their FFRDC's and all others that spend \$50,000 or more for R&D activities; NSF Form 411-S is mailed to doctorate-granting institutions only in the alternate years. A copy of the FY 1977 full-scale survey form follows.

References

The following NSF publications contain findings from the most recent expenditures survey:

Expenditures for Scientific and Engineering Activities at Universities and Colleges

FY 1973: (NSF 75-316). Available from NSF, GPO, and NTIS (PB 249 153)

FY 1974: (NSF 76-303). Available from NSF, GPO, and NTIS (PB 253 433)

Expenditures for Scientific Activities at Universities and Colleges

FY 1975: (NSF 77-307). Available from NSF, GPO, and NTIS (PB 272 970)

FY 1976: *Tables* (NSF 77-316). Available from NSF and NTIS (PB 272 881)

Science Resources Studies Highlights (NSF 77-314). Available from NSF

FY 1977: *Tables* (NSF 78-311). Available from NSF and NTIS (PB 284 373)

Science Resources Studies Highlights (NSF 78-319). Available from NSF

Data Access

Data tapes are currently available for fiscal years 1972, 1973, 1974, 1975, 1976, and 1977. The survey populations for the available years are as follows:

Fiscal year 1972—591 FFRDC's	Academic Institutions; 23
Fiscal year 1973—591 FFRDC's	Academic Institutions; 23
Fiscal year 1974—602 FFRDC's	Academic Institutions; 22
Fiscal year 1975—539 FFRDC's	Academic Institutions; 22
Fiscal year 1976—538 FFRDC's	Academic Institutions; 21
Fiscal year 1977—539 FFRDC's	Academic Institutions; 21

For further information regarding data tape availability or contents, please contact:

Moshman Associates, Inc.
University Statistics Group
6400 Goldsboro Road
Washington, D.C. 20034
301/229-3000

The cost of the tapes is \$80 per tape for the first five tapes (one survey year on each tape) and \$50 for each additional tape. A *Data User Guide* has been developed for 1972-77 tape users that documents the compatible code structure utilized in NSF's Integrated Data Base—a 4-survey system of academic institutions' R&D personnel and financial resources devoted to S/E activities, of which this survey is a part.

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ITEM 1. CURRENT EXPENDITURES FOR SEPARATELY BUDGETED RESEARCH AND DEVELOPMENT (R&D) IN THE SCIENCES AND ENGINEERING, BY SOURCE OF FUNDS AND TYPE OF ACTIVITY, FY 1977 (Include indirect costs)

ITEM 1. INSTRUCTIONS

Separately budgeted research and development includes all funds expended for activities specifically organized to produce research outcomes and commissioned by an agency either external to the institution or separately budgeted by an organizational unit within the institution. Include expenditures from both the unrestricted and restricted current fund accounts. Exclude training grants, public service grants, demonstration projects, etc.

Include in lines a through e and line g restricted funds which include those monies restricted by the sponsor as to the specific operating purpose for which they could be expended. The determination of restricted or unrestricted (institutional) funds reflects the ability of your institution to change the purpose for which the funds are expended without further authorization from the source of the monies. The restricted funds category of Federal, State, or local governments includes all R&D expenditures from funds received through appropriations, grants, or contracts from these sources and restricted by them as to use. The funding source is determined by the organization (e.g., State government, foundation, etc.) that designates the money for R&D even if your organization determines which projects are to be funded. Include indirect costs reimbursed or reimbursable from outside sources.

Under a. Federal Government include grants and contracts earmarked for research and development by all agencies of the Federal Government.

Under b. State government include funds designated for R&D by the State government and its agencies. Include here State funds supporting research and development at agricultural experiment stations.

Under c. local government include funds designated for R&D by county, municipal, or other local governments and their agencies.

Under d. Foundations and voluntary health agencies include grants specified for R&D. Funds from foundations which are affiliated with or grant solely to your institution should be included under f. **Institutional funds.** Funds specifically designated for R&D and derived from a health agency that is a unit of a State or local government should be reported under State or local government.

Under e. Industry include all grants and contracts allocated to R&D by profitmaking organizations, whether engaged in production, distribution, research, service, or other activities. Do not include grants and contracts from nonprofit foundations financed by industry, which should be reported under Foundations.

Under f. Institutional funds include any funds which the institution was free to designate for R&D (include indirect costs). These funds may include: (1) Unrestricted or general-purpose State or local government appropriations; (2) general-purpose grants from industry, foundations, or other outside sources; (3) tuition and fees; (4) endowment income; and (5) the unreimbursed indirect costs incurred in association with R&D projects financed by outside organizations (e.g., mandatory Federal cost sharing on grants, etc.).

If your institution now separately budgets what was previously classified as departmental research, these data should be included in line f. If your accounts do not separately identify departmental research expenditures but include them as part of the instruction and departmental research account, these data should be reported in item 3 in accordance with the instructions.

Please exclude from your response any R&D expenditures in the fields of education, law, humanities, music, the arts, physical education, library science, and all other nonscience fields.

Source of funds	(1) Total R&D expenditures	(2) Basic research	(3) Applied research	(4) Development
	(Thousands of dollars)	(Percent of column 1)		
a. Federal Government. 1110	\$	_____ %	_____ %	_____ %
b. State government 1120		Basic research is directed toward an increase of knowledge; it is research where the primary aim of the investigator is a fuller knowledge or understanding of the subject under study rather than a practical application thereof.	Applied research is directed toward the practical application of knowledge. The definition of applied research differs from basic research chiefly in terms of the objectives of the investigator.	Development is the systematic use of knowledge directed toward the design and production of useful prototypes, materials, devices, systems, methods, or processes. It does not include quality control or routine product testing.
c. Local government 1130				
d. Private foundations and voluntary health agencies 1140				
e. Industry 1150				
f. Institutional funds 1160				
g. All other outside sources 1170				
h. Total (sum of a through g) 1100	\$	_____ %	_____ %	_____ %

Total R&D expenditures reported in line 1100 column (1) and line 1400 column (1) should be the same.

Federally financed R&D expenditures reported in line 1110 column (1) and line 1400 column (2) should be the same.

**ITEM 2. TOTAL AND FEDERALLY FINANCED EXPENDITURES FOR SEPARATELY BUDGETED
RESEARCH AND DEVELOPMENT, BY FIELD OF SCIENCE, FY 1977 (Include indirect costs)**

Field of science	Illustrative disciplines		Thousands of dollars	
			(1) Total	(2) Federal
a. ENGINEERING (TOTAL)	Aeronautical, agricultural, chemical, civil, electrical, industrial, mechanical, metallurgical, mining, nuclear, petroleum, bio- and biomedical, energy, textile, architecture	1410	\$	\$
b. PHYSICAL SCIENCES (TOTAL)		1420		
(1) Astronomy	Astrophysics, optical and radio, x-ray, gamma-ray, neutrino	1421		
(2) Chemistry	Inorganic, organo-metallic, organic, physical, analytical, pharmaceutical, polymer science (exclude biochemistry)	1422		
(3) Physics	Acoustics, atomic and molecular, condensed matter, elementary particles, nuclear structure, optics, plasma	1423		
(4) Other	Used for multidisciplinary projects within physical sciences and for disciplines not requested separately	1424		
c. ENVIRONMENTAL SCIENCES (TOTAL)	ATMOSPHERIC SCIENCES: Aeronomy, solar weather modification, meteorology, extra-terrestrial atmospheres GEOLOGICAL SCIENCES: Engineering geophysics, geology, geodesy, geomagnetism, hydrology, geochemistry, paleomagnetism, paleontology, physical geography, cartography, seismology, soil sciences OCEANOGRAPHY: Chemical, geological, physical, marine geophysics, marine biology, biological oceanography	1430		
d. MATHEMATICAL AND COMPUTER SCIENCES (TOTAL)		1440		
(1) Mathematics	Algebra, analysis, applied mathematics, foundations and logic, geometry, numerical analysis, statistics, topology	1441		
(2) Computer sciences	Design, development, and application of computer capabilities to data storage and manipulation, information science	1442		
e. LIFE SCIENCES (TOTAL)		1450		
(1) Biological sciences	Anatomy, biochemistry, biophysics, biogeography, ecology, embryology, entomology, genetics, immunology, microbiology, nutrition, parasitology, pathology, pharmacology, physical anthropology, physiology, botany, zoology	1451		
(2) Agricultural	Agricultural chemistry, agronomy, animal science, conservation, dairy science, plant science, range science, wildlife	1452		
(3) Medical	Anesthesiology, cardiology, endocrinology, gastroenterology, hematology, neurology, obstetrics, ophthalmology, preventive medicine and community health, psychiatry, radiology, surgery, veterinary medicine, dentistry, pharmacy	1453		
(4) Other	Used for multidisciplinary projects within life sciences	1454		
f. PSYCHOLOGY (TOTAL)	Animal behavior, clinical, educational, experimental, human development and personality, social	1460		
g. SOCIAL SCIENCES (TOTAL)		1470		
(1) Economics	Econometrics, international, industrial, labor, agricultural, public finance and fiscal policy	1471		
(2) Political science	Regional studies, comparative government, international relations, legal systems, political theory, public administration	1472		
(3) Sociology	Comparative and historical, complex organizations, culture and social structure, demography, group interactions, social problems and welfare, theory	1473		
(4) Other	History of science, cultural anthropology, linguistics, socio-economic geography, research in education	1474		
h. OTHER SCIENCES, n.s.c. (TOTAL)*	To be used when the multidisciplinary and interdisciplinary aspects make the classification under one primary field impossible	1480		
i. TOTAL (SUM of a through h) Check to insure that column totals are identical with data reported in item 1.		1400		

*PLEASE EXCLUDE FROM YOUR RESPONSE ANY R&D EXPENDITURES IN THE FIELDS OF EDUCATION, LAW, HUMANITIES, MUSIC, THE ARTS, PHYSICAL EDUCATION, LIBRARY SCIENCE, AND ALL OTHER NONSCIENCE FIELDS.

ITEM 3. CURRENT EXPENDITURES FOR INSTRUCTION AND DEPARTMENTAL RESEARCH IN THE SCIENCES AND ENGINEERING, BY FIELD OF SCIENCE, FY 1977 (Direct expenditures only)

COMPLETE ITEM 3 IF YOUR INSTITUTION GRANTS A DOCTORATE OR MASTER'S DEGREE IN EITHER THE SCIENCES OR ENGINEERING

ITEM 3. INSTRUCTIONS

Include the salaries of department heads, faculty members, secretaries and technicians; office and laboratory supplies; and expenditures for degree credit instructional programs in science and engineering subjects. The time spent in supervising the thesis work of graduate students should be reported as an expenditure for instruction, not for departmental research. Departmental research (nonsponsored research) is "personal" or "faculty" research supported by General Funds of the department as a specifically assigned, departmentally planned, or mutually understood part of the faculty member's total activity. If departmental research expenditures are now separately budgeted at your institution, they should be reported in items 1 & 2 rather than in item 3.

Does your institution separately budget departmental research? YES _____ beginning in 19____ NO _____

If YES, are the expenditures for this item reported in items 1 & 2? YES _____ NO _____

Field of science		Total instruction and departmental research (Thousands of dollars) (1)	Departmental research as a percent of col. 1 (No decimals) (2)
a. Engineering	1510	\$	%
b. Physical sciences	1520		%
c. Environmental sciences	1530		%
d. Mathematical and computer sciences	1540		%
e. Life sciences	1550		%
f. Psychology	1560		%
g. Social sciences	1570		%
h. Other sciences, n.e.c.	1580		%
i. Total (sum of a through h)	1500	\$	

ITEM 4. CAPITAL EXPENDITURES FOR SCIENTIFIC AND ENGINEERING FACILITIES AND EQUIPMENT FOR RESEARCH, DEVELOPMENT, AND INSTRUCTION, BY FIELD OF SCIENCE, FY 1977

ITEM 4. INSTRUCTIONS

Report funds for facilities which were in process or completed during FY 1977. Expenditures for administration buildings, steam plants, residence halls, and other such facilities should be excluded unless utilized principally for research, development, or instruction in engineering or in the sciences. Land costs should be excluded. Exclude small equipment items in your current fund account costing approximately \$200 to \$500 or less, as determined by institutional policy.

Facilities and equipment expenditures include the following: (a) fixed equipment such as built-in equipment and furnishings; (b) movable scientific equipment such as oscilloscopes, pulse-height analyzers; (c) movable furnishings such as desks; (d) architect's fees, site work, extension of utilities, and the building costs of service functions such as integral cafeterias and bookstores of a facility; (e) facilities constructed to house separate components such as medical schools and teaching hospitals; and (f) special separate facilities used to house scientific apparatus such as accelerators, oceanographic vessels, and computers.

Field of science		Thousands of dollars		
		Total (1)	Federal Government (2)	All other sources (3)
a. Engineering	1710	\$	\$	\$
b. Physical sciences	1720			
c. Environmental sciences	1730			
d. Mathematical and computer sciences	1740			
e. Life sciences	1750			
f. Psychology	1760			
g. Social sciences	1770			
h. Other sciences, n.e.c.	1780			
i. Total (sum of a through h)	1700	\$	\$	\$

Survey of Federal Support to Universities, Colleges, and Selected Nonprofit Institutions

Purpose

The interagency system for reporting Federal obligations to universities and colleges was originally established in 1963 under the auspices of the Committee on Academic Science and Engineering (CASE) of the National Research Council. Since 1968 these data have been collected annually by NSF through the Survey of Federal Support to Universities, Colleges, and Selected Nonprofit Institutions. Data are currently supplied by 14 Federal agencies accounting for over 95 percent of all Federal obligations to the institutions included.

The data elements included in the survey include obligations for both academic science and nonscience activities. Within the former, separate data are collected on: (1) Research and development; (2) R&D plant; (3) facilities and equipment for instruction in the sciences and engineering; (4) fellowships, traineeships, and training grants; (5) general support for science and engineering; and (6) all other science and engineering activities. "Nonscience" activities represent direct funding (excluding loans) for activities or purposes not specifically related to the sciences and engineering, such as research, education, and facilities in the arts and humanities and general purpose institutional support.

Survey Instrument

More detailed information about the participating agencies and subagencies, the definitions of the categories of support and the fields of science, and the formats used by agencies when submitting data are found in the annual NSF publication *Instructions and Specifications for Reporting Federal Obligations to Academic and Selected Nonprofit Institutions*, copies of which are available from the Division of Science Resources Studies.

References

The following NSF publications contain findings from the most recent Federal obligations survey:

Federal Support to Universities, Colleges, and Selected Nonprofit Institutions

FY 1969: (NSF 70-27)

FY 1970: (NSF 71-28). Available from NTIS (PB 223 168)

FY 1971: (NSF 73-300). Available from NTIS (PB 223 175)

FY 1972: (NSF 74-305). Available from NTIS (PB 235 343)

FY 1973: (NSF 75-304). Available from NTIS (PB 242 802)

FY 1974: (NSF 76-305). Available from NSF, GPO, and NTIS (PB 263 541)

FY 1975: (NSF 77-311). Available from NSF, GPO, and NTIS (PB 272 871)

FY 1976: *Tables* (77-325). Available from NSF and NTIS (PB 280 294)

Science Resources Studies Highlights (NSF 78-308). Available from NSF

Data Access

Data tapes are currently available for fiscal years 1971, 1972, 1973, 1974, 1975, 1976, and the Transition Quarter; a data tape for fiscal year 1977 will be available in spring 1979. The survey populations for the available years are given below; the counts shown for 1971 to 1973 include academic institutions only, since data for FFRDC's and nonprofit institutions were not available for these years.

	Total	Academic	ACAD FFRDC's	Non-profit
Fiscal year 1971	2383	2383	—	—
Fiscal year 1972	2434	2434	—	—
Fiscal year 1973	2461	2461	—	—
Fiscal year 1974	2661	2511	21	130
Fiscal year 1975	2720	2514	21	186
Fiscal year 1976	2762	2538	21	206
Transition Quarter	2600	2440	20	142
Fiscal year 1977	2807	2568	21	218

For further information regarding data tape availability or contents, please contact:

Moshman Associates, Inc.
University Statistics Group
6400 Goldsboro Road
Washington, D.C. 20034
301/229-3000

The cost of the tapes is \$80 per tape for the first five tapes (one survey year on each tape) and \$50 for

each additional tape. A *Data User Guide* has been developed for 1971-77 tape users that documents the compatible code structure utilized in NSF's Integrated Data Base—a 4-survey system of aca-

demic institutions' R&D personnel and financial resources devoted to S/E activities, of which this survey is a part.

Survey of Federal Funds for Research and Development

Purpose

The *Federal Funds* survey—an annual series that began with fiscal year 1952 and has continued without interruption since that time—provides comprehensive statistical information on the size and scope of Federal funding for research and development and the types of institutions and purposes to which such funds are directed. The R&D data are shown by character of work, type of performer, field of science, geographic (State) distribution and R&D plant.

Survey Instrument

A copy of the most recent survey tables (forms) covering appropriate data to be reported follows this statement.

References

Data from this survey as published since 1970 by NSF can be found in:

Federal Funds for Research, Development, and Other Scientific Activities

FY 1969, 1970, and 1971: Volume XIX (NSF 70-38)

FY 1970, 1971, and 1972: Volume XX (NSF 71-35)

FY 1971, 1972, and 1973: Volume XXI (NSF 72-317)

FY 1972, 1973, and 1974: Volume XXII (NSF 74-300)

Available from NTIS (PB 242 853)

FY 1973, 1974, and 1975: Volume XXIII (NSF 74-320)

Available from NTIS (PB 242 850)

FY 1974, 1975, and 1976: Volume XXIV (NSF 75-334)

Available from NTIS (PB 253 434)

FY 1975, 1976, and 1977: Volume XXV (NSF 77-301)

Available from NSF, GPO, and NTIS (PB 265 696)

FY 1976, 1977, and 1978: Volume XXVI (NSF 78-300)

Available from NSF, GPO, and NTIS (PB 284 473)

Federal Funds for Research and Development

FY 1977, 1978, and 1979: Volume XXVII (NSF 79-310)

(In press) Available from NSF and GPO

Data Access

Federal Funds survey data from FY 1970-80 are available on tape from:

Moshman Associates, Inc.

6400 Goldsboro Road

Washington, D.C. 20034

301/229-3000

Federal Funds survey data prior to FY 1970 are available on hard copy only from the Government Studies Group, Division of Science Resources Studies, NSF. A complete survey instrument (questionnaire) can also be obtained from this Group. Prior-year data in some cases (particularly for basic research) do not reflect subsequent reclassification changes. Consequently, the Government Studies Group should be contacted regarding limitations in the use of such data.

**ANNUAL SURVEY
of
FEDERAL FUNDS
for
RESEARCH and DEVELOPMENT**

VOLUME XXVIII

**Fiscal Years 1978,
1979, and 1980**

**Conducted by the
NATIONAL SCIENCE FOUNDATION**

NSF FORM 818

Please indicate the individual in your organization to whom inquiries may be addressed concerning the response:

Name _____
 Title _____
 Office _____
 Address _____

 Phone No. _____
 (Outside line)

OMB No. 95-RQ218
 Interagency Report Control
 No. 1155 NSF-A.N

Table 1
Outlays for research and development and R&D plant
fiscal years 1978, 1979, and 1980
 [Dollars in thousands]

Agency _____ Subdivision _____		FY 1978		FY 1979		FY 1980
Item	Appropriation title and program by activity ¹	FF XXVII Estimate	FF XXVIII Actual	FF XXVII Estimate	FF XXVIII Estimate	FF XXVIII Estimate
	<i>Research & development</i> ²					
1	Total, research & development					
	<i>R&D plant</i>					
2	Total, R&D plant					
0	Total research & development and R&D plant					
3	R&D plant as % of item 0	%	%	%	%	%

¹The activity classifications to be listed under each appropriation title should be those shown in the 1980 Federal budget.

²Use additional sheet, as necessary.

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Table II
Summary of obligations for research and development and R&D plant
fiscal years 1978, 1979, and 1980
(Dollars in thousands)

Agency _____		Subdivision _____				
Item	CHARACTER OF WORK	FY 1978		FY 1979		FY 1980
		FF XXVII Estimate	FF XXVIII Actual	FF XXVII Estimate	FF XXVIII Estimate	FF XXVIII Estimate
1	Basic research					
	As % of item 5	%	%	%	%	%
2	Applied research					
	As % of item 5	%	%	%	%	%
3	Total research ¹					
	As % of item 5	%	%	%	%	%
4	Development					
	As % of item 5	%	%	%	%	%
5	Total research & development					
6	Total R&D plant					
	As % of item 0	%	%	%	%	%
0	Total research & development and R&D plant					

¹ Basic research plus applied research equals total research.

Table III
Obligations for basic, applied, and total research
by field of science, fiscal year 1978
[Dollars in thousands]

OAS No. 99-RS218
 Interagency Report Control
 No. 1155 NSF-AN

Agency Code	Field of science	Subdivision					
		Basic research		Applied research		Total research ¹	
		FF XXVII Estimate	FF XXVIII Actual	FF XXVII Estimate	FF XXVIII Actual	FF XXVII Estimate	FF XXVIII Actual
100000	Life sciences, total						
110000	Biological (excluding environmental)						
115000	Environmental biology						
120000	Agricultural						
125000	Medical						
130000	Life sciences, n.e.c. ²						
200000	Psychology, total						
210000	Biological aspects						
220000	Social aspects						
230000	Psychological sciences, n.e.c. ²						
300000	Physical sciences, total						
310000	Astronomy						
320000	Chemistry						
330000	Physics						
340000	Physical sciences, n.e.c. ²						
400000	Environmental sciences, total						
410000	Atmospheric sciences						
420000	Geological sciences						
430000	Oceanography						
440000	Environmental sciences, n.e.c. ²						
500000	Mathematics and computer sciences, total						
510000	Mathematics						
520000	Computer sciences						
530000	Mathematics and computer sciences, n.e.c. ²						
600000	Engineering, total						
610000	Aeronautical						
620000	Astronautical						
630000	Chemical						
640000	Civil						
650000	Electrical						
660000	Mechanical						
670000	Metallurgy and materials						
680000	Engineering, n.e.c. ²						
700000	Social sciences, total						
710000	Anthropology						
720000	Economics						
730000	Political science						
740000	Sociology						
750000	Social sciences, n.e.c. ²						
800000	Other sciences, n.e.c. ²						
000000	Total, all fields ³						

¹Basic research plus applied research equals total research.

²Not elsewhere classified.

³Totals equal items 1, 3, and 5, respectively, in table II for 1978 or basic research, applied research and total research.

Table IV
Obligations for basic, applied, and total research
by field of science, fiscal year 1979
[Dollars in thousands]

OMB No. 99-RD-218
Interagency Report Control
No. 1155 NSF-AN

Agency		Subdivision					
Code	Field of science	Basic research		Applied research		Total research ¹	
		FF XXVII Estimate	FF XXVIII Estimate	FF XXVII Estimate	FF XXVIII Estimate	FF XXVII Estimate	FF XXVIII Estimate
100000	Life sciences, total						
110000	Biological (excluding environmental)						
115000	Environmental biology						
120000	Agricultural						
125000	Medical						
130000	Life sciences, n.e.c. ²						
200000	Psychology, total						
210000	Biological aspects						
220000	Social aspects						
230000	Psychological sciences, n.e.c. ²						
300000	Physical sciences, total						
310000	Astronomy						
320000	Chemistry						
330000	Physics						
340000	Physical sciences, n.e.c. ²						
400000	Environmental sciences, total						
410000	Atmospheric sciences						
420000	Geological sciences						
430000	Oceanography						
440000	Environmental sciences, n.e.c. ²						
500000	Mathematics and computer sciences, total						
510000	Mathematics						
520000	Computer sciences						
530000	Mathematics and computer sciences, n.e.c. ²						
600000	Engineering, total						
610000	Aeronautical						
620000	Astronautical						
630000	Chemical						
640000	Civil						
650000	Electrical						
660000	Mechanical						
670000	Metallurgy and materials						
680000	Engineering, n.e.c. ²						
700000	Social sciences, total						
710000	Anthropology						
720000	Economics						
730000	Political science						
740000	Sociology						
750000	Social sciences, n.e.c. ²						
800000	Other sciences, n.e.c. ²						
000000	Total, all fields ³						

¹Basic research plus applied research equals total research.

²Not elsewhere classified.

³Totals equal items 1, 2, and 3, respectively, in table II for 1979 for basic research, applied research and total research.

Table V
Obligations for basic, applied, and total research
by field of science, fiscal year 1980
(Dollars in thousands)

OMB No. 99-R0218
Interagency Report Control
No. 1155 NSF-AN

Agency	Subdivision			
		Basic research	Applied research	Total research ¹
Code	Field of science	FF XXVIII Estimate	FF XXVIII Estimate	FF XXVIII Estimate
100000	Life sciences, total			
110000	Biological (excluding environmental)			
115000	Environmental biology			
120000	Agricultural			
125000	Medical			
130000	Life sciences, n.e.c. ²			
200000	Psychology, total			
210000	Biological aspects			
220000	Social aspects			
230000	Psychological sciences, n.e.c. ²			
300000	Physical sciences, total			
310000	Astronomy			
320000	Chemistry			
330000	Physics			
340000	Physical sciences, n.e.c. ²			
400000	Environmental sciences, total			
410000	Atmospheric sciences			
420000	Geological sciences			
430000	Oceanography			
440000	Environmental sciences, n.e.c. ²			
500000	Mathematics and computer sciences, total			
510000	Mathematics			
520000	Computer sciences			
530000	Mathematics and computer sciences, n.e.c. ²			
600000	Engineering, total			
610000	Aeronautical			
620000	Astronautical			
630000	Chemical			
640000	Civil			
650000	Electrical			
660000	Mechanical			
670000	Metallurgy and materials			
680000	Engineering, n.e.c. ²			
700000	Social sciences, total			
710000	Anthropology			
720000	Economics			
730000	Political science			
740000	Sociology			
750000	Social sciences, n.e.c. ²			
800000	Other sciences, n.e.c. ²			
000000	Total, all fields ³			

¹ Basic research plus applied research equals total research

² Not elsewhere classified

³ Totals equal items 1, 2, and 3, respectively, in table II for 1980 for basic research, applied research and total research

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Table VI
Obligations for research and development by performer and character of work
fiscal year 1978
[Dollars in thousands]

Agency _____		Subdivision _____					
ITEM	PERFORMER	Basic research		Applied research		Development	
		FF XXVII Estimate	FF XXVIII Actual	FF XXVII Estimate	FF XXVIII Actual	FF XXVII Estimate	FF XXVIII Actual
1	Federal intramural ¹						
	As % of total (item 00)	%	%	%	%	%	%
2	Personnel costs ²	()	()	()	()	()	()
3	Industrial firms, excluding FFRDC's ³						
	As % of total (item 00)	%	%	%	%	%	%
4	FFRDC's ³ adm. by industrial firms						
	As % of total (item 00)	%	%	%	%	%	%
5	Universities and colleges, excluding FFRDC's ³						
	As % of total (item 00)	%	%	%	%	%	%
6	FFRDC's ³ adm. by universities and colleges						
7	Nonprofit inst. excluding FFRDC's ³						
8	FFRDC's ³ adm. by nonprofit institutions						
9	State and local governments						
10	Total, all domestic performers						
11	Foreign ⁴						
12	Amount of item 11 supported by separate appropriations for "special foreign cur- rency programs"	()	()	()	()	()	()
00	Total, all performers ⁵						

¹For each total (basic research, applied research, or development), there must be an entry for item 1 (Federal intramural). Even if all work is performed extramurally, the costs associated with the planning and administration of such programs by Federal personnel must be reported.

²Amount of item 1 for personnel costs.

³Federally funded research and development centers. (See p. 41 for list.)

⁴See page 3 for definition of foreign performers.

⁵Totals equal items 1, 2, and 4, respectively, in table II for 1978 for basic research, applied research, and development.

Table VII
Obligations for research and development by performer and character of work
fiscal year 1979
[Dollars in thousands]

Agency _____ Subdivision _____							
Item	PERFORMER	Basic research		Applied research		Development	
		FF XXVII Estimate	FF XXVIII Estimate	FF XXVII Estimate	FF XXVIII Estimate	FF XXVII Estimate	FF XXVIII Estimate
1	Federal intramural ¹						
	As % of total (item 00)	%	%	%	%	%	%
2	Personnel costs ²	()	()	()	()	()	()
3	Industrial firms, excluding FFRDC's ³						
	As % of total (item 00)	%	%	%	%	%	%
4	FFRDC's ³ adm. by industrial firms						
	As % of total (item 00)	%	%	%	%	%	%
5	Universities and colleges, excluding FFRDC's ³						
	As % of total (item 00)	%	%	%	%	%	%
6	FFRDC's ³ adm. by universities and colleges						
7	Nonprofit inst. excluding FFRDC's ³						
8	FFRDC's ³ adm. by nonprofit institutions						
9	State and local governments						
10	Total, all domestic performers						
11	Foreign ⁴						
12	Amount of item 11 supported by separate appropriations for "special foreign currency programs"	()	()	()	()	()	()
00	Total, all performers ⁵						

¹For each total (basic research, applied research, or development), there must be an entry for item 1 (Federal intramural). Even if all work is performed extramurally, the costs associated with the planning and administration of such programs by Federal personnel must be reported.

²Amount of item 1 for personnel costs.

³Federally funded research and development centers. (See p. 41 for list.)

⁴See page 3 for definition of foreign performers.

⁵Totals equal items 1, 2, and 4, respectively, in table II for 1979 for basic research, applied research, and development.

Table VIII
Obligations for research and development by performer and character of work
fiscal year 1980
[Dollars in thousands]

Agency	Subdivision			
Item	PERFORMER	Basic research FF XXVIII Estimate	Applied research FF XXVIII Estimate	Development FF XXVIII Estimate
1	Federal intramural ¹			
	As % of total (item 00)	%	%	
2	Personnel costs ²	()	()	()
3	Industrial firms, excluding FFRDC's ³			
	As % of total (item 00)	%	%	%
4	FFRDC's ³ adm. by industrial firms			
	As % of total (item 00)	%	%	%
5	Universities and colleges, excluding FFRDC's ³			
	As % of total (item 00)	%	%	%
6	FFRDC's ³ adm. by universities and colleges			
7	Nonprofit inst. excluding FFRDC's ³			
8	FFRDC's ³ adm. by nonprofit institutions			
9	State and local governments			
10	Total, all domestic performers			
11	Foreign ⁴			
12	Amount of item 11 supported by separate appropriations for "special foreign currency programs"	()	()	()
00	Total, all performers ⁵			

¹ For each total (basic research, applied research, or development), there must be an entry for item 1 (Federal intramural). Even if all work is performed extramurally, the costs associated with the planning and administration of such programs by Federal personnel must be reported.

² Amount of item 1 for personnel costs.

³ Federally funded research and development centers. (See p. 41 for list.)

⁴ See page 3 for definition of foreign performers.

⁵ Totals equal items 1, 2, and 4, respectively, in table II for 1980 for basic research, applied research, and development.

Table IX
Obligations for research and development and R&D plant
at individual federally funded research and development centers
fiscal year 1978
[Dollars in thousands]

Agency _____ Subdivision _____		
Federally funded research and development centers (FFRDC's). (Report obligations for any FFRDC used by respondent agency.)	R&D obligations	R&D plant obligations
Administered by industrial firms:		
Bettis Atomic Power Laboratory (Westinghouse Electric Corp.), Pittsburgh, Pa.		
Frederick Cancer Research Center (Litton Bionetics, Inc., Litton Industries), Frederick, Md.		
Hanford Engineering Development Laboratory (Westinghouse-Hanford Corp.), Richland, Wash.		
Oak Ridge National Laboratory (Union Carbide Corp.), Oak Ridge, Tenn.		
Idaho National Engineering Laboratory (Aerojet Nuclear Corp.), Idaho Falls, Idaho		
Knolls Atomic Power Laboratory (General Electric Company), Schenectady, N.Y.		
Liquid Metal Engineering Center (Rockwell International Corporation), Santa Susana, Calif.		
Mound Laboratory (Monsanto Research Corp.), Miamisburg, Ohio		
Sandia Laboratory (Western Electric Co., Inc.-Sandia Corp.), Sandia, N.M.		
Savannah River Laboratory (E.I. du Pont de Nemours & Co., Inc.), Aiken, S.C.		
Total	1/	2/
Administered by universities and colleges:		
Ames Laboratory (Iowa State University of Science and Technology), Ames, Iowa		
Argonne National Laboratory (University of Chicago and Argonne Universities Assn), Argonne, Ill.		
Brookhaven National Laboratory (Associated Universities, Inc.), Upton, Long Island, N.Y.		
Center for Naval Analyses (University of Rochester), Arlington, Va.		
Cerro Tololo Inter-American Observatory (Association of Universities for Research in Astronomy, Inc.), La Serena, Chile		
E. O. Lawrence Berkeley Laboratory (University of California), Berkeley, Calif.		
E. O. Lawrence Livermore Laboratory (University of California), Livermore, Calif.		
Fermilab (Universities Research Association, Inc.), Batavia, Ill.		
Jet Propulsion Laboratory (California Institute of Technology), Pasadena, Calif.		
Kitt Peak National Observatory (Associated Universities for Research in Astronomy, Inc.), Tucson, Ariz.		

Table IX (Con.)
Obligations for research and development and R&D plant
at individual federally funded research and development centers
fiscal year 1978

[Dollars in thousands]

Agency	Subdivision	
Federally funded research and development centers (FFRDC's). (Report obligations for any FFRDC used by respondent agency.)	R&D obligations	R&D plant obligations
Administered by universities and colleges (con.):		
Lincoln Laboratory (Massachusetts Institute of Technology), Lexington, Mass.		
Los Alamos Scientific Laboratory (University of California), Los Alamos, N.M.		
National Astronomy and Ionosphere Center (Cornell University), Arecibo, P.R.		
National Center for Atmospheric Research (University Corporation for Atmospheric Research), Boulder, Colo.		
National Radio Astronomy Observatory (Associated Universities, Inc.), Green Bank, W. Va.		
Oak Ridge Associated Universities, Oak Ridge, Tenn.		
Plasma Physics Laboratory (Princeton University), Princeton, N.J.		
Sacramento Peak Observatory (Associated Universities for Research in Astronomy, Inc.), Sunspot, N.M.		
Space Radiation Effects Laboratory (College of William and Mary), Williamsburg, Va.		
Stanford Linear Accelerator Center (Stanford University), Stanford, Calif.		
Total	2/	4/
Administered by other nonprofit institutions:		
Aerospace Corporation, El Segundo, Calif.		
Institute for Defense Analyses (IDA), Arlington, Va.		
MITRE Corporation, Bedford, Mass.		
Pacific Northwest Laboratory (Battelle Memorial Institute), Richland, Wash.		
Project Air Force (RAND Corporation) ⁵ , Santa Monica, Calif.		
Solar Energy Research Institute (Midwest Research Institute), Golden, Colo.		
	8/	2/

¹Totals equal combined obligations for basic research, applied research, and development, as reported in item 4 of table VI.

²Totals equal item 3 of table XI for 1978.

³Totals equal combined obligations for basic research, applied research, and development, as reported in item 6 of table VI.

⁴Totals equal item 5 of table XI for 1978.

⁵Only the Project Air Force portion of the RAND Corporation is to be reported as an FFRDC. All other agency support to RAND will be reported under nonprofit institutions excluding FFRDC's.

⁶Totals equal combined obligations for basic research, applied research, and development, as reported in item 8 of table VI.

⁷Totals equal item 7 of table XI for 1978.

Note: Each supporting agency should report obligations to each FFRDC it uses even though the FFRDC may be under the sponsorship of another agency. See pages 41 and 42 for list of FFRDC's shown by sponsoring agency and administering organizations.

Table X

Obligations for basic research and total research and development to foreign performers¹
by geographic area and country
fiscal year 1978
[Dollars in thousands]

Agency _____		Subdivision _____	
Code	GEOGRAPHIC AREA AND COUNTRY	Basic research only ²	Total research and development ³
010000	Europe, total		
010100	Austria		
010200	Belgium		
010300	Denmark		
010400	Finland		
010500	France		
010600	Iceland		
010700	Ireland		
010800	Italy		
010900	Netherlands		
011000	Norway		
011100	Poland		
011200	Portugal		
011300	Spain		
011400	Sweden		
011500	Switzerland		
011600	United Kingdom, total		
011610	England		
011620	Scotland		
011630	Bermuda		
011640	Other United Kingdom.		
011700	West Germany.		
011800	Yugoslavia		
011900	Other Europe		

¹See page 3 for definition of a foreign performer.

²Total of columns equals item 11 for basic research in table VI.

³Total of columns equals the sum of basic research, applied research, and development in item 11 in table VI.

Table X (con.)
Obligations for basic research and total research and development to foreign performers¹
by geographic area and country
fiscal year 1978
[Dollars in thousands]

Agency _____		Subdivision _____	
Code	GEOGRAPHIC AREA AND COUNTRY	Basic research only ²	Total research and development ³
020000	Asia, total		
020100	Burma		
020200	Cambodia		
020300	Hong Kong		
020400	India		
020500	Indonesia		
020600	Japan		
020700	South Korea		
020800	Malaysia		
020900	Pakistan		
021000	Philippines		
021100	Taiwan		
021200	Thailand		
021300	South Vietnam		
021400	Other Asia		
030000	Near East, total		
030100	Greece		
030200	Israel		
030300	Jordan		
030400	Lebanon		
030500	Syria		
030600	Turkey		
030700	United Arab Republic		
030800	Other Near East		

¹See page 3 definition of a foreign performer.

²Total of columns equals item 11 for basic research in table VI.

³Total of columns equals the sum of the basic research, applied research, and development in item 11 in table VI.

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Table X (con.)
Obligations for basic research and total research and development to foreign performers¹
by geographic area and country
fiscal year 1978
[Dollars in thousands]

Agency _____ Subdivision _____			
Code	GEOGRAPHIC AREA AND COUNTRY	Basic research only ²	Total research and development ³
040000	Africa, total		
040100	Kenya		
040200	Liberia		
040300	Nigeria		
040400	Sudan		
040500	Uganda		
040600	Union of South Africa		
040700	Other Africa		
050000	Latin America, total		
050100	Argentina		
050200	Bolivia		
050300	Brazil		
050400	Chile		
050500	Colombia		
050600	Costa Rica		
050700	Ecuador		
050800	El Salvador		
050900	Mexico		
051000	Panama		
051100	Peru		
051200	Uruguay		
051300	Venezuela		
051400	Other Latin America		
060000	Australia		
070000	Canada		
080000	New Zealand		
090000	International organizations		
000000	Total, all areas and organizations		

¹See page 3 for definition of a foreign performer.

²Total of column equals item 11 for basic research in table VI.

³Total of column equals the sum of basic research, applied research, and development in item 11 in table VI.

Table XI
Obligations for R&D plant by performer of research and development supported
fiscal years 1978, 1979 and 1980
[Dollars in thousands]

Agency _____		Subdivision _____				
Item	PERFORMER OF RESEARCH AND DEVELOPMENT SUPPORTED	FY 1978		FY 1979		FY 1980
		FF XXVII Estimate	FF XXVIII Actual	FF XXVII Estimate	FF XXVIII Estimate	FF XXVIII Estimate
1	Federal intramural					
2	Industrial firms, excluding FFRDC's ¹ . . .					
3	FFRDC's ¹ adm. by industrial firms					
4	Universities and colleges, excluding FFRDC's ¹					
5	FFRDC's ¹ administered by universities and colleges					
6	Nonprofit inst. excluding FFRDC's ¹					
7	FFRDC's ¹ adm. by nonprofit institutions . .					
8	State and local governments					
9	Total, all domestic performers					
10	Foreign ²					
00	Total, all performers ³					

¹Federally funded research and development centers.
²See page 5 for definition of foreign R&D plant.
³Equals item 6 of table II.

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Table A. Obligations for research and development, by State and performer, fiscal year 1976

(Dollars in thousands)

Agency		Subdivision								
CODE NO.	State ¹	Federal intramural	Industrial firms excluding FFRDC's ²	FFRDC's ³ admin. by industrial firms	Univ. and colleges excluding FFRDC's ⁴	FFRDC's ⁵ admin. by univ. and colleges	Other nonprofit institutions excluding FFRDC's ⁶	FFRDC's ⁷ admin. by other nonprofit institutions	State and local governments	
00000	Total	2	3	4	5	6	7	8	9	
10001	ALABAMA									
11001	ALASKA									
12001	ARIZONA									
13001	ARKANSAS									
14002	CALIFORNIA									
15002	COLORADO									
16011	CONNECTICUT									
17001	DELAWARE									
18002	DIST. OF COLUMBIA									
19003	FLORIDA									
20004	GEORGIA									
21003	HAWAII									
22003	IDAH0									
23001	ILLINOIS									
24002	INDIANA									
25001	IOWA									
26002	KANSAS									
27002	KENTUCKY									
28002	LOUISIANA									
29002	MAINE									
30005	MARYLAND									
31013	MASSACHUSETTS									
32003	MICHIGAN									
33003	MINNESOTA									
34003	MISSISSIPPI									
35004	MISSOURI									
36004	MONTANA									
37005	NEBRASKA									
38005	NEVADA									
39014	NEW HAMPSHIRE									
40001	NEW JERSEY									
41005	NEW MEXICO									
42002	NEW YORK									
43006	NORTH CAROLINA									
44006	NORTH DAKOTA									
45004	OHIO									
46002	OKLAHOMA									
47004	OREGON									
48003	PENNSYLVANIA									
49015	RHODE ISLAND									
50007	SOUTH CAROLINA									
51007	SOUTH DAKOTA									
52004	TENNESSEE									
53004	TEXAS									
54007	UTAH									
55016	VERMONT									
56006	VIRGINIA									
57006	WASHINGTON									
58006	WEST VIRGINIA									
59006	WISCONSIN									
60006	WYOMING									
61100	OUTLYING AREAS									
62200	OFFICES ABROAD									

¹Federally funded research and development centers.

²Under Outlying Areas include Puerto Rico and the Panama Canal Zone as well as U. S. territories and possessions. Under Offices Abroad include obligations for research and development performed and/or administered abroad by the U. S. Government.

³Total equals combined obligations for basic research, applied research, and development, as reported in item 1, table VI, of the survey.

⁴Total equals combined obligations for basic research, applied research, and development, as reported in item 2, table VI, of the survey.

⁵Total equals combined obligations for basic research, applied research, and development, as reported in item 3, table VI, of the survey.

⁶Total equals combined obligations for basic research, applied research, and development, as reported in item 4, table VI, of the survey.

⁷Total equals combined obligations for basic research, applied research, and development, as reported in item 5, table VI, of the survey.

⁸Total equals combined obligations for basic research, applied research, and development, as reported in item 6, table VI, of the survey.

⁹Total equals combined obligations for basic research, applied research, and development, as reported in item 7, table VI, of the survey.

¹⁰Total equals combined obligations for basic research, applied research, and development, as reported in item 8, table VI, of the survey.

¹¹Total equals combined obligations for basic research, applied research, and development, as reported in item 9, table VI, of the survey.

Please indicate the individual to whom inquiries may be addressed concerning the data provided in tables A and B.

Name & title _____

Office _____

Phone No. _____ (Outside line)

Table B. Obligations for R&D plant, by State and performer of research and development supported, fiscal year 1978

[Dollars in thousands]

Agency		Subdivision								
CODE NO.	State ¹	Federal intramural	Industrial firms excluding FFRDC's*	FFRDC's* admin. by industrial firms	Univ. and colleges excluding FFRDC's*	FFRDC's* admin. by univ. and colleges	Other nonprofit institutions excluding FFRDC's*	FFRDC's* admin. by other nonprofit institutions	State and local governments	
00000	Total	1	2	3	4	5	6	7	8	
10001	ALABAMA									
11001	ALASKA									
12001	ARIZONA									
13071	ARKANSAS									
14002	CALIFORNIA									
15002	COLORADO									
16011	CONNECTICUT									
17001	DELAWARE									
18002	DIST. OF COLUMBIA									
19003	FLORIDA									
20004	GEORGIA									
21003	HAWAII									
22003	IDAHO									
23031	ILLINOIS									
24032	INDIANA									
25041	IOWA									
26042	KANSAS									
27002	KENTUCKY									
28072	LOUISIANA									
29012	MAINE									
30006	MARYLAND									
31012	MASSACHUSETTS									
32003	MICHIGAN									
33043	MINNESOTA									
34003	MISSISSIPPI									
35044	MISSOURI									
36004	MONTANA									
37046	NEBRASKA									
38006	NEVADA									
39014	NEW HAMPSHIRE									
40021	NEW JERSEY									
41006	NEW MEXICO									
42022	NEW YORK									
43006	NORTH CAROLINA									
44046	NORTH DAKOTA									
45034	OHIO									
46073	OKLAHOMA									
47004	OREGON									
48023	PENNSYLVANIA									
49016	RHODE ISLAND									
50007	SOUTH CAROLINA									
51047	SOUTH DAKOTA									
52004	TENNESSEE									
53074	TEXAS									
54007	UTAH									
55016	VERMONT									
56006	VIRGINIA									
57006	WASHINGTON									
58006	WEST VIRGINIA									
59036	WISCONSIN									
60006	WYOMING									
61100	OUTLYING AREAS									
62000	OFFICES ABROAD									

* Federally funded research and development centers.
¹ Under Outlying Areas include Puerto Rico and the Panama Canal Zone as well as U.S. territories and possessions. Under Offices Abroad include obligations for R&D plant located abroad but used in support of research and development performed by agencies of the U.S. Government.

² Total equals item 1, table XI, for FY 1978 of the survey.
³ Total equals item 2, table XI, for FY 1978 of the survey.
⁴ Total equals item 3, table XI, for FY 1978 of the survey.
⁵ Total equals item 4, table XI, for FY 1978 of the survey.
⁶ Total equals item 5, table XI, for FY 1978 of the survey.
⁷ Total equals item 6, table XI, for FY 1978 of the survey.
⁸ Total equals item 7, table XI, for FY 1978 of the survey.
⁹ Total equals item 8, table XI, for FY 1978 of the survey.

Please indicate the individual to whom inquiries may be addressed concerning the data provided in Tables A and B.

Name and title _____
Office _____
Phone No. _____
(Outside line)

* Federally funded research and development centers.

¹ Outlying Areas include Puerto Rico and the Panama Canal Zone as well as U.S. territories and possessions. Under Offices Abroad include obligations for R&D plant located abroad but used in support of research and development performed by agencies of the U.S. Government.

² Total equals item 1, table XI, for FY 1978 of the survey.

³ Total equals item 2, table XI, for FY 1978 of the survey.

⁴ Total equals item 3, table XI, for FY 1978 of the survey.

⁵ Total equals item 4, table XI, for FY 1978 of the survey.

⁶ Total equals item 5, table XI, for FY 1978 of the survey.

⁷ Total equals item 6, table XI, for FY 1978 of the survey.

⁸ Total equals item 7, table XI, for FY 1978 of the survey.

⁹ Total equals item 8, table XI, for FY 1978 of the survey.

Please indicate the individual to whom inquiries may be referred concerning the data provided in Tables A and B.

Name & title _____

Office _____

Phone No. _____

(Outside line)

Table C
Obligations for basic, applied, and total research,
by field of science, fiscal year 1978
 (Dollars in thousands)

OHS No. 99-10218
 Interagency Report Control
 No. 1155 NSF-AN

Agency		Subdivision					
Code	Field of science	Basic research		Applied research		Total research ¹	
		FF XXVII Estimate	FF XXVIII Actual	FF XXVII Estimate	FF XXVIII Actual	FF XXVII Estimate	FF XXVIII Actual
100000	Life sciences, total						
110000	Biological (excluding environmental)						
115000	Environmental biology						
120000	Agricultural						
125000	Medical						
130000	Life sciences, n.e.c. ²						
200000	Psychology, total						
210000	Biological aspects						
220000	Social aspects						
230000	Psychological sciences, n.e.c. ²						
300000	Physical sciences, total						
310000	Astronomy						
320000	Chemistry						
330000	Physics						
340000	Physical sciences, n.e.c. ²						
400000	Environmental sciences, total						
410000	Atmospheric sciences						
420000	Geological sciences						
430000	Oceanography						
440000	Environmental sciences, n.e.c. ²						
500000	Mathematics and computer sciences, total						
510000	Mathematics						
520000	Computer sciences						
530000	Mathematics and computer sciences, n.e.c. ²						
600000	Engineering, total						
610000	Aeronautical						
620000	Astronautical						
630000	Chemical						
640000	Civil						
650000	Electrical						
660000	Mechanical						
670000	Metallurgy and materials						
680000	Engineering, n.e.c. ²						
700000	Social sciences, total						
710000	Anthropology						
720000	Economics						
730000	Political science						
740000	Sociology						
750000	Social sciences, n.e.c. ²						
800000	Other sciences, n.e.c. ²						
000000	Total, all fields ³						

¹Basic research plus applied research equals total research.

²Not elsewhere classified. Specify type of activity on reverse of this page.

³Totals equal totals for basic research and applied research in item 5, table VI.

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Table D
Obligations for basic, applied, and total research,
performed at universities and colleges,
by field of science, fiscal year 1979
[Dollars in thousands]

OMB No. 99-R0218
Interagency Report Control
No. 1155 NSF-AN

Agency		Subdivision					
Code	Field of science	Basic research		Applied research		Total research ¹	
		FF XXVII Estimate	FF XXVIII Estimate	FF XXVII Estimate	FF XXVIII Estimate	FF XXVII Estimate	FF XXVIII Estimate
100000	Life sciences, total						
110000	Biological (excluding environmental)						
115000	Environmental biology						
120000	Agricultural						
125000	Medical						
130000	Life sciences, n.e.c. ²						
200000	Psychology, total						
210000	Biological aspects						
220000	Social aspects						
230000	Psychological sciences, n.e.c. ²						
300000	Physical sciences, total						
310000	Astronomy						
320000	Chemistry						
330000	Physics						
340000	Physical sciences, n.e.c. ²						
400000	Environmental sciences, total						
410000	Atmospheric sciences						
420000	Geological sciences						
430000	Oceanography						
440000	Environmental sciences, n.e.c. ²						
500000	Mathematics and com- puter sciences, total						
510000	Mathematics						
520000	Computer sciences						
530000	Mathematics and com- puter sciences, n.e.c. ²						
600000	Engineering, total						
610000	Aeronautical						
620000	Astronautical						
630000	Chemical						
640000	Civil						
650000	Electrical						
660000	Mechanical						
670000	Metallurgy and materials						
680000	Engineering, n.e.c. ²						
700000	Social sciences, total						
710000	Anthropology						
720000	Economics						
730000	Political science						
740000	Sociology						
750000	Social sciences, n.e.c. ²						
800000	Other sciences, n.e.c. ²						
000000	Total, all fields ³						

¹ Basic research plus applied research equals total research.

² Not elsewhere classified. Specify type of activity on reverse of this page.

³ Totals equal totals for basic research and applied research in item 5, table VII.

Table E
Obligations for basic, applied, and total research,
performed at universities and colleges
by field of science, fiscal year 1980
[Dollars in thousands]

OMB No. 99-R0218
Interagency Report Control
No. 1155 NSF-AN

Agency	Code	Field of science	Subdivision		
			Basic research FF XXVIII Estimate	Applied research FF XXVIII Estimate	Total research ¹ FF XXVIII Estimate
	100000	Life sciences, total			
	110000	Biological (excluding environmental)			
	115000	Environmental biology			
	120000	Agricultural			
	125000	Medical			
	130000	Life sciences, n.e.c. ²			
	200000	Psychology, total			
	210000	Biological aspects			
	220000	Social aspects			
	230000	Psychological sciences, n.e.c. ²			
	300000	Physical sciences, total			
	310000	Astronomy			
	320000	Chemistry			
	330000	Physics			
	340000	Physical sciences, n.e.c. ²			
	400000	Environmental sciences, total			
	410000	Atmospheric sciences			
	420000	Geological sciences			
	430000	Oceanography			
	440000	Environmental sciences, n.e.c. ²			
	500000	Mathematics and computer sciences, total			
	510000	Mathematics			
	520000	Computer sciences			
	530000	Mathematics and computer sciences, n.e.c. ²			
	600000	Engineering, total			
	610000	Aeronautical			
	620000	Astronautical			
	630000	Chemical			
	640000	Civil			
	650000	Electrical			
	660000	Mechanical			
	670000	Metallurgy and materials			
	680000	Engineering, n.e.c. ²			
	700000	Social sciences, total			
	710000	Anthropology			
	720000	Economics			
	730000	Political science			
	740000	Sociology			
	750000	Social sciences, n.e.c. ²			
	800000	Other sciences, n.e.c. ²			
	000000	Total, all fields ³			

¹ Basic research plus applied research equals total research.

² Not elsewhere classified. Specify type of activity on reverse of this page.

³ Totals equal totals for basic research and applied research in item 5, table VIII.

Survey of State Government Research and Development

Purpose

R&D expenditure data of State government agencies are collected periodically by character of work, fields of science, performer, source of funds, functional area, and R&D plant. R&D personnel data are also collected. Data have been collected in four separate surveys by the Bureau of the Census on behalf of NSF covering fiscal years 1964-65, 1967-68, 1972-73, and 1977. The data are designed to help delineate the role that research and development plays in furthering State government objectives, particularly efforts to solve the wide range of societal problems in such areas as health, transportation, energy, crime, poverty, and pollution.

Survey Instrument

A copy of the most recent survey instrument (questionnaire) is attached to this statement.

References

Data from this survey as published by NSF since 1970 can be found in:

Research and Development in State Government Agencies

FY 1967 and 1968: (NSF 70-22)

FY 1972 and 1973: (NSF 75-303)

Available from NSF, GPO, and NTIS (PB 242 851)

FY 1973: *Reviews of Data on Science Resources*

Available from NSF, GPO, and NTIS (PB 243 984)

Data from the FY 1977 survey are expected to be available by summer 1979.

Data Access

Survey data for FY 1977 will be available on tape from:

Bureau of the Census
Governments Division
Washington, D.C. 20233
301/763-5094

Survey data for FY 1972-73 are available on hard copy only from the Government Studies Group, Division of Science Resources Studies, NSF.

INFORMATION SUPPLIED BY		FORM 5-479 7-24-75	U.S. DEPARTMENT OF COMMERCE BUREAU OF THE CENSUS ACTING AS A COLLECTION AGENT FOR NATIONAL SCIENCE FOUNDATION
Name		SURVEY OF LOCAL AGENCY RESEARCH AND DEVELOPMENT	
Title			
Agency name			
Address - Number and street			
City			
State		ZIP code	
Telephone			
Area code	Number	Extension	
For assistance call collect - David Nihel (301) 763-5094		RETURN TO Bureau of the Census ATTN: Governments Division Washington, D.C. 20233	

(Please correct any error in name and address including ZIP code)

DEFINITIONS AND REPORTING INSTRUCTIONS

Before filling out this form, carefully read each part and all related definitions and instructions. If you determine that your agency is not engaged in research and development, mark (X) in the box below, enter your name, address, and telephone number in the space provided above, and return this form to the Bureau of the Census in the envelope provided.

If survey is not applicable to this agency, mark (X) in this box. ☐

If you determine that your agency is engaged in research and development, complete all sections of this form. Report data for each project as fully as possible. If some items do not apply, enter "None" or a dash in the space provided. Return the original copy of the survey form in the accompanying preaddressed envelope. The green copy is for your files.

SURVEY COVERAGE

This survey covers the research and development activities of agencies of local governments for fiscal year 1977. Excluded as reporting units are local public universities and colleges (including junior and community colleges) and their affiliated organizations, such as research centers, medical schools, etc. These are covered in other surveys conducted by the National Science Foundation.

This survey is intended to collect information on the research and development activities of your entire agency. If there are some projects of your agency about which you lack adequate information for reporting, indicate these in item 15. To be reported is R&D work done as part of your own program, R&D work done for others on a reimbursable basis, and R&D work contracted out.

GENERAL CONCEPTS AND DEFINITIONS

A. Research and development (R&D) activities are defined as follows:

1. **Research** - Systematic, intensive study directed toward fuller scientific knowledge or understanding of the subject studied. Research may be classified as either basic or applied.

Basic research is concerned essentially with gaining a fuller knowledge or understanding of the subject under study.

Applied research is concerned primarily with a practical use of knowledge or understanding for the purpose of meeting a recognized need.

2. **Development** - Systematic use of the knowledge or understanding gained from research directed toward the production of useful materials, devices, systems, or methods, including design and development of prototypes and processes.

B. **Exclusions from research and development:**

1. Training of scientific manpower
2. Dissemination of scientific information
3. Surveying and topographic mapping
4. Routine product testing
5. Quality control
6. Adoption of new technology
7. Collection of general purpose statistics (statistics not collected as part of a specific R&D project)

NOTE - Certain activities may or may not be classified as research or development depending upon circumstances. Examples of such activities are given on the supplemental instruction sheet. See **Side A, Supplemental Instructions**.

B. **R&D plant** encompasses facilities and fixed equipment, including acquisition, construction, major repairs, and alterations of structures, works, equipment, and facilities, and land used in support of research and development. Excluded are expendable equipment and miscellaneous items, such as office furniture and supplies.

C. Selected Financial Terms

1. **Fiscal year 1977** - The 12-month accounting period of your agency that ended within the calendar year 1977.

Enter the beginning and ending dates of your fiscal year 1977. This period should be used to report data under items 8 through 10.

	Month	Day	Year
Beginning			
Ending			1977

2. **Expenditures** - All amounts of money paid out by your agency to support R&D activities.

3. **Current expenditures** - All expenditures except those for R&D plant.

4. **Federal funds** - All Federal monies used in support of the R&D activities of your agency. These include reimbursements, cost-sharing arrangements, contracts, grants, and any identifiable amounts spent from Federal discretionary programs such as general revenue sharing. Included are Federal funds which are "passed through" State governments as well as those received directly from Federal agencies.

5. **State funds** - All State monies used in support of the R&D activities of your agency. These include reimbursements, cost-sharing arrangements, contracts, grants, and any identifiable amounts spent from State general support programs.

6. **Own agency funds** - Funds of your agency only.

7. **Other local agency funds** - Funds provided by other agencies of your local government.

8. **Other local government funds** - Funds provided by other local governments that are used in support of the R&D activities performed by your government.

REPORTING INSTRUCTIONS

Report data for (1) all R&D work conducted directly by the staff of your agency (includes work performed as part of your own program as well as work done for others), and (2) R&D work performed by others under contract or grant from your agency. Include amounts expended from all funds of your local agency (from general funds, Federal grant funds, State funds, special funds, bond funds, etc.). R&D projects conducted by your agency that are partially or fully financed by Federal, State, or local government agencies or private organizations are to be included.

Consolidated projects - Each project should be reported separately. But when separate reporting is not practical, you may report as a single project a group of similar projects where the type of research or development work (item 4) and the field of science (item 6) would be identically marked. But report each project separately when the type of research or development work or the field of science differ.

Additional space - If more than four projects are to be reported, use the enclosed continuation sheets. All continuation sheets should bear the Census reference number shown on the address label and should be attached to the back form.

Items 1 through 5 - Instructions for these items are contained within the items.

Item 6, **R&D expenditures by type** - Report the total expenditure for each project (including related overhead costs). Expenditures that apply to two or more projects should be allocated as accurately as possible among each project. Total expenditures should be distributed between current R&D expenditures and R&D plant expenditures under items 8a and 8b.

Item 7, **Current R&D expenditures by source** - Distribute the current expenditure amount reported under item 6a according to the following categories:

- a. Federal Government sources (grants, reimbursements, cost-sharing arrangements, etc.)
- b. State government sources (grants, reimbursements, etc.)
- c. Own agency sources (funds of your agency only)
- d. Other local agency sources. List the name(s) of the "other local agencies" of your government in the "Notes" section on page 3.
- e. Other local government sources. List the name(s) of the "other local governments" in the "Notes" section on page 3.
- f. Other sources (grants, reimbursements, or cost-sharing amounts provided by foundations, business firms, universities and colleges, or other outside sources). List "other" sources in the "Notes" section on page 3.

Item 8, **Current R&D expenditures by performer** - Distribute the current expenditure amount reported under item 6a among the various government agencies or other organizations actually performing the R&D work.

Item 9, **R&D plant expenditures by source** - Distribute total expenditures for R&D plant reported under item 6b according to the following categories: (See instructions for item 7 above.)

- a. Federal Government sources
- b. State government sources
- c. Own agency sources (funds of your agency only)
- d. Other local agency sources
- e. Other local government sources
- f. Other sources

Item 10, **Person-years** - Report person-years for the calendar year of a 12-month year) worked by your own employees. For employees who worked part-time or on more than one project, allocate person-years proportionately to each project, not number of employees. For example, two employees each working half a year (6 months) on an R&D project would be classified as one person-year. Do not include any personnel employed by other performers.

Items 11 through 15 - These supplemental questions are asked to obtain further information on the funding and management of your R&D activities.

Include any available publications or other written material that describe and explain the R&D activities of your agency.

The "Notes" section on page 3 may be used to explain items further.

Please review this form before transmitting the original to the Bureau of the Census in the envelope provided.

Item	CENSUS USE ONLY								
		R&D Project							
1. Name of local agency subdivision (Division, Section, etc.)									
2. Title of project									
3. Nature of project - Enter a brief description, in non-technical terms of each project and its primary applications or objectives. If additional space is needed, continue in "Notes" section on page 3.									
4. Character of work (basic research, applied research, or development) - Mark (X) in one box (If project involves more than one type of activity, report each phase (basic, applied, or development) as a separate project.)		☐ Basic research ☐ Development ☐ Applied research							
5. Field of science - Mark (X) in one box according to the primary field of science involved. Field of science should be determined by the nature of the project rather than the type of personnel employed. Definitions for these fields are listed on Side B of the Supplemental Instructions.		☐ Biological sciences ☐ Medical sciences ☐ Psychology ☐ Physical sciences ☐ Environmental sciences ☐ Mathematics and computer sciences ☐ Engineering ☐ Economics ☐ Other social sciences ☐ Other sciences not elsewhere classified							
6. TOTAL R&D expenditures - Distribute by type at a and b below.									
a. Current R&D expenditures									
b. R&D plant									
7. Current R&D expenditures by source TOTAL R&D current expenditures - Total should equal item 6a; distribute below at a through f.									
a. Federal Government sources - Describe further under item 11.									
b. State government sources - Describe further under item 11.									
c. Own agency sources									
d. Other local agency sources - Specify agency name(s) in "Notes" section on page 3.									
e. Other local government sources - Specify government name(s) in "Notes" section on page 3.									
f. Other sources - Specify source name(s) in "Notes" section on page 3.									
8. Current R&D expenditures by performer TOTAL R&D current expenditures - Total should equal item 6a; distribute below at a, b, and c.									
a. R&D work performed directly by your agency (including expenses of your personnel related to the administration of R&D grants and contracts)									
b. Grants, contracts, and reimbursements to universities and colleges (public and private), and their affiliated hospitals, agricultural experiment stations, research centers, etc. (1) State universities and colleges									
(2) Local public universities and colleges									
(3) Private universities and colleges									
c. Grants, contracts, and reimbursements to other performers (1) Private individuals or firms									
(2) Private nonprofit organizations									
(3) Other local governments - Specify government name(s) in "Notes" section on page 3.									
(4) Other agencies of your own government - Specify agency name(s) in "Notes" section on page 3.									
(5) State government agencies - Specify agency name(s) in "Notes" section on page 3.									
(6) Other governmental agencies, including Federal or multigovernmental agencies									
9. R&D plant expenditures by source TOTAL R&D plant expenditures - Total should equal item 6b; distribute below at a through f.									
a. Federal Government sources									
b. State government sources									
c. Own agency sources									
d. Other local agency sources - Specify agency name(s) in "Notes" section on page 3.									
e. Other local government sources - Specify government name(s) in "Notes" section on page 3.									
f. Other sources - Specify source name(s) in "Notes" section on page 3.									
10. Person-years of your agency's own personnel actually engaged in the project - (DO NOT report employees of other R&D performers. (Report to nearest tenth of a year.) TOTAL person-years - Distribute below at a, b, and c.									
a. Scientists and engineers (those having at least a bachelor's degree or equivalent work experience)									
b. Technicians (those having at least two years of training beyond the high school level)									
c. Other personnel (typists, clerks, administrative personnel, etc.)									
11. List EACH supporting Federal or State agency and the amount of funds provided by each that are included under 7a or 7b. If funding for a particular project was received from more than one agency, supply details in the "Notes" section on page 3.		Name of agency							
a. Name and type of agency - Mark (X) for type of agency		☐ Federal ☐ State							
b. Amount of funds provided									
c. Type of award - Mark (X) in one box		☐ Specific project award ☐ Other							
12. Was this project previously financed in whole or in part by Federal funds - Mark (X) in one box.		☐ Yes ☐ No							

Survey of Local Agency Research and Development

Purpose

R&D expenditure data of local governments (municipalities, counties, school districts, special districts, hospital districts, and townships) are collected periodically by character of work, fields of science, performers, source of funds, functional area, and R&D plant. R&D personnel data are also collected. Data have been collected in three separate surveys by the Bureau of the Census on behalf of NSF covering fiscal years 1966-67, 1968-69, and 1977. By providing data on the nature and extent of local government participation in research and development, the surveys serve as a starting point for further study of local government use of science and technology.

Survey Instrument

A copy of the most recent survey instrument (questionnaire) is attached to this statement.

References

Data from the survey as published by NSF since 1970 can be found in:

Research and Development in Local Governments
FY 1968 and 1969: (NSF 71-6)

Data from the FY 1977 survey expected to be available by summer 1979.

Data Access

Survey data for FY 1977 will be available on tape from:

Bureau of the Census
Government Division
Washington, D.C. 20233
301/763-5094

Survey data for FY 1968-69 are available on hard copy only from the Government Studies Group, Division of Science Resources Studies, NSF.

INFORMATION SUPPLIED BY		FORM 5-476 (9-77)	U.S. DEPARTMENT OF COMMERCE BUREAU OF THE CENSUS ACTION AS A COLLECTION AGENT FOR NATIONAL SCIENCE FOUNDATION
Name		SURVEY OF STATE GOVERNMENT RESEARCH AND DEVELOPMENT	
Title			
Agency name			
Address - Number and street			
City			
State		ZIP code	
Telephone			
Area code	Number	Extension	
For assistance call collect - Barndale De Hart (800) 763-5884		RETURN TO Bureau of the Census ATTN: Governmental Division Washington, D.C. 20231	

DEFINITIONS AND REPORTING INSTRUCTIONS

Before filling out this form, carefully read each part and all related definitions and instructions. If you determine that your agency is not engaged in research and development, mark (X) in the box below, enter your name, address, and telephone number in the space provided above, and return this form to the Bureau of the Census in the envelope provided.

If survey is not applicable to this agency, mark (X) in this box. ☐

If you determine that your agency is engaged in research and development, complete all sections of this form. Report data for each project as fully as possible. If some items do not apply, enter "None" or a dash in the space provided. Return the original copy of the survey form in the accompanying preaddressed envelope. The green copy is for your files.

SURVEY COVERAGE

This survey covers the research and development activities of State government agencies, including State legislatures, for fiscal year 1977. Excluded as reporting units are State universities and colleges and their affiliated organizations, such as research centers, medical schools, etc. These are covered in other surveys conducted by the National Science Foundation.

This survey is intended to collect information on the research and development activities of your entire agency. If there are some projects of your agency about which you lack adequate information for reporting, indicate the agency subdivisions performing these projects in item 15. To be reported are R&D work done as part of your own programs, R&D work done for others on a reimbursable basis, and R&D work contracted out.

GENERAL CONCEPTS AND DEFINITIONS

A. Research and development (R&D) activities are defined as follows:

1. Research - Systematic, intensive study directed toward fuller scientific knowledge or understanding of the subject studied. Research may be classified as either basic or applied. Basic research is concerned essentially with gaining a fuller knowledge or understanding of the subject under study. Applied research is concerned primarily with a practical use of knowledge or understanding for the purpose of meeting a recognized need.
2. Development - Systematic use of the knowledge or understanding gained from research directed toward the production of useful materials, devices, systems, or methods, including design and development of prototypes and processes.

Exclusions from research and development:

1. Training of scientific manpower
2. Dissemination of scientific information
3. Surveying and topographic mapping
4. Routine product testing
5. Quality control
6. Adoption of new technology
7. Collection of general-purpose statistics (statistics not collected as part of a specific R&D project)

NOTE - Certain activities may or may not be classified as research or development depending upon circumstances. Examples of such activities are given on the supplemental instruction sheet. See Sub A, Supplemental Instructions.

B. R&D plant encompasses facilities and fixed equipment, including acquisition, construction, major repair, and alterations of structures, works, equipment, and facilities, and land used in support of research and development. Excluded are expendable equipment and miscellaneous items, such as office furniture and supplies.

C. Selected Financial Terms

1. Fiscal year 1977 - The 12-month accounting period of your agency that ended within the calendar year 1977.

Enter the beginning and ending dates of your fiscal year 1977. This period should be used to report data under items 8 through 10.

	Month	Day	Year
Beginning			
Ending			1977

2. Expenditures - All amounts of money paid out by your agency to support R&D activities.

3. Current expenditures - All expenditures except those for R&D plant.

4. Federal funds - All Federal monies used in support of the R&D activities of your agency. These include reimbursements, cost-sharing arrangements, contracts, grants, and any identifiable amounts spent from Federal discretionary programs such as general revenue sharing.

5. Own agency funds - Funds of your agency only.

REPORTING INSTRUCTIONS

Report data for (1) all R&D work conducted directly by staff of your agency (includes work performed as part of your own agency's program as well as work done for others), and (2) R&D work performed by others under contract or grants from your agency. Include amounts expended from all funds available to your agency (general funds, Federal grant funds, State funds, special funds, bond funds, etc.). R&D projects conducted by your agency that are partially or fully financed by Federal, State, or local government agencies or private organizations are to be included.

Consolidated projects - Each project should be reported separately. But when separate reporting is not practical, you may report as a single project a group of similar projects where the type of research or development work (item 4) and the field of science (item 5) would be identically marked. But report each project separately when the type of research or development work, or the field of science differ.

Additional space - If more than four projects are to be reported, use the enclosed continuation sheets. Write the Census reference number contained on the address label on all continuation sheets and attach these sheets to the basic form.

Items 1 through 5 - Instructions for these items are contained within the items.

Item 6, R&D expenditures by type - Report the total expenditures for each project (including related overhead costs). Expenditures that apply to two or more projects should be allocated as accurately as possible among each project. Total expenditures should be distributed between current R&D expenditures and R&D plant expenditures at items 8a and 8b.

Item 7, Current R&D expenditures by source of funds - Distribute the current expenditure amount reported under item 6a according to the following categories:

- a. Federal Government sources (grants, reimbursements, cost-sharing arrangements, "pass-through" money, etc.)
- b. Own sources (funds of your agency only)
- c. Funds provided by other agencies of your State government. List the name(s) of such "other agency" in the "Notes" section on page 3.
- d. Funds provided by agencies of other State governments. List the name(s) of such "other agency" in the "Notes" section on page 3.
- e. Other sources (grants, reimbursements or cost-sharing amounts provided by foundations, business firms, universities and colleges, or other outside sources). List "other" sources in the "Notes" section on page 3.

Item 8, Current R&D expenditures by performer - Distribute the current expenditure amount reported at item 6a among the various government agencies or other organizations actually performing the R&D work.

Item 9, R&D plant expenditures by source - Distribute total expenditures for R&D plant reported at item 6b according to the following categories:

- a. Federal Government sources
- b. Own sources (funds of your agency only)
- c. Funds provided by other agencies of your State government
- d. Funds provided by agencies of other State governments
- e. Other sources

Item 10, Person-years - Report person-years (to the nearest tenth of a 12-month year) worked by your own employees. For employees who worked part-time or on more than one project, allocate person-years applied to each project, not number of employees. For example, two employees, each working half a year (6 months) on an R&D project would be classified as one person-year. Do not include any personnel employed by other performers.

Items 11 through 15 - These supplemental questions are asked to obtain further information on the funding and management of your R&D activities.

Include any available publications or other written material that describe and explain the R&D activities of your unit or agency.

The "Notes" section on page 3 may be used to explain items further.

Please review this form before transmitting the original to the Bureau of the Census in the envelope provided.

Item	CENSUS USE ONLY								
		R&D Project							
1. Name of agency subdivision (Bureau, Division, Section, etc.)									
2. Title of project									
3. Nature of project - Enter a brief description, in non-technical terms, of each project and its primary applications or objectives. If additional space is needed, continue in "Notes" section on page 3.									
4. Character of work (basic research, applied research, or development) - Mark (X) in one box. If project involves more than one type of activity, report each phase (basic, applied, or development) as a separate project.		☐ Basic research ☐ Applied research ☐ Development							
5. Field of science - Mark (X) in one box for each project according to the primary field of science involved. Field of science should be determined by the nature of the project rather than the type of personnel employed. Definitions for these fields are listed on Side B of the Supplemental Instructions.		☐ Biological sciences ☐ Medical sciences ☐ Psychology ☐ Physical sciences ☐ Environmental sciences ☐ Mathematics and computer sciences ☐ Engineering ☐ Economics ☐ Other social sciences ☐ Other sciences not elsewhere classified							
6. TOTAL R&D expenditures - Distribute by type at a and b below.									
a. Current R&D expenditures									
b. R&D plant									
7. Current R&D expenditures by source TOTAL R&D current expenditures - Total should equal item 6a; distribute below at a through e.									
a. Federal Government sources - Describe further under item 11.									
b. Own sources - Funds of your agency									
c. Funds provided by other agencies of your State government - Specify agency name(s) in "Notes" section on page 3.									
d. Funds provided by agencies of other State governments - Specify agency name(s) in "Notes" section on page 3.									
e. Other sources - Specify source name(s) in "Notes" section on page 3.									
8. Current R&D expenditures by performer TOTAL R&D current expenditures - Total should equal item 6a; distribute below at a, b, and c.									
a. R&D work performed directly by your agency (including expenses of your personnel related to the administration of R&D grants and contracts)									
b. Grants, contracts, and reimbursements to universities and colleges (public and private), and their affiliated hospitals, agricultural experiment stations, research centers, etc. (1) State universities and colleges									
(2) Local public universities and colleges									
(3) Private universities and colleges									
c. Grants, contracts, and reimbursements to other performers (1) Private individuals or firms									
(2) Private nonprofit organizations									
(3) Other agencies of your State government - Specify agency name(s) in "Notes" section on page 3.									
(4) Agencies of other State governments - Specify agency name(s) in "Notes" section on page 3.									
(5) Other governmental agencies, including Federal, local, or multigovernmental agencies									
9. R&D plant expenditures by source of funds TOTAL R&D plant expenditures - Total should equal item 6b; distribute below at a through e.									
a. Federal Government sources									
b. Own sources - Funds of your agency									
c. Funds provided by other agencies of your State government - Specify agency name(s) in "Notes" section on page 3.									
d. Funds provided by agencies of other State governments - Specify agency name(s) in "Notes" section on page 3.									
e. Other sources - Specify source name(s) in "Notes" section on page 3.									
10. Person-years of your agency's own personnel actually engaged in the project - DO NOT report employees of other R&D performers. (Report to nearest tenth of a year.) TOTAL person-years - Distribute below at a, b, and c.									
a. Scientists and engineers (those having at least a bachelor's degree or equivalent work experience)									
b. Technicians (those having at least two years of training beyond the high school level)									
c. Other personnel (typists, clerks, administrative personnel, etc.)									
11. List EACH supporting Federal agency and the amount of funds provided by each that are included under item 7a. If funding for a particular project was received from more than one Federal agency, supply details in the "Notes" section on page 3.									
a. Name of Federal agency									
b. Amount of Federal funds provided									
c. Type of Federal award - Mark (X) in one box.		☐ Specific project award ☐ Other							
12. Was this project previously financed in whole or in part by Federal funds? - Mark (X) in one box.		☐ Yes ☐ No							

